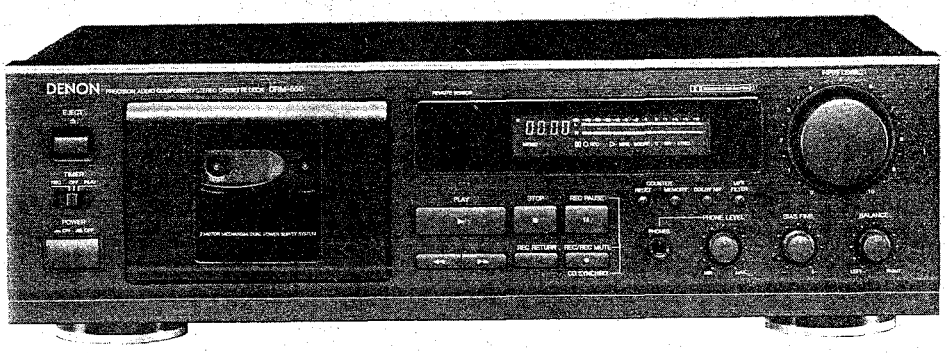
DENON

SERVICE MANUAL

MODEL DRM-550

STEREO CASSETTE TAPE DECK



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NIPPON COLUMBIA CO., LTD.

IMPORTANT TO SAFETY

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION:

1. **Handle the power supply cord carefully**
   Do not damage or deform the power supply cord. If it is damaged or deformed, it may cause electric shock or malfunction when used. When removing it from wall outlet, be sure to remove by holding the plug attachment and not by pulling the cord.
2. **Do not open the top cover**
   In order to prevent electric shock, do not open the top cover. If problems occur, contact your DENON DEALER.
3. **Do not place anything inside**
   Do not place metal objects or spill liquid inside the cassette tape deck. Electric shock or malfunction may result.

Please, record and retain the Model name and serial number of your set shown on the rating label.
Model No. DRM-550 Serial No. _____

- **FOR U.S.A. & CANADA MODEL ONLY**

CAUTION

TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

- **POUR LES MODELES AMERICAINS ET CANADIENS UNIQUEMENT**

ATTENTION

POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instruction in the literature accompanying the appliance.

● DECLARATION OF CONFORMITY

We declare under our sole responsibility that this product, to which this declaration relates, is in conformity with the following standards:
EN55013, EN55020, EN60555-2 and EN60555-3.

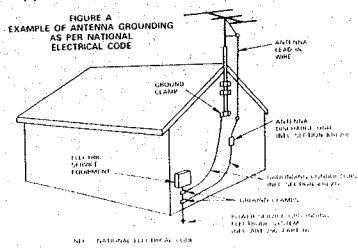
SAFETY INSTRUCTIONS

1. Read Instructions – All the safety and operating instructions should be read before the appliance is operated.
2. Retain Instructions – The safety and operating instructions should be retained for future reference.
3. Heed Warnings – All warnings on the appliance and in the operating instructions should be adhered to.
4. Follow Instructions – All operating and use instructions should be followed.
5. Water and Moisture – The appliance should not be used near water – for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
6. Carts and Stands – The appliance should be used only with a cart or stand that is recommended by the manufacturer.

6A. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

7. Wall or Ceiling Mounting – The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
8. Ventilation – The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
9. Heat – The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
10. Power Sources – The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
11. Grounding or Polarization – Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.

FIGURE A
EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE



12. Power-Cord Protection – Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
14. Cleaning – The appliance should be cleaned only as recommended by the manufacturer.
15. Power Lines – An outdoor antenna should be located away from power lines.
16. Outdoor Antenna Grounding – If an outside antenna is connected to the receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna-discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure A.
17. Nonuse Periods – The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
18. Object and Liquid Entry – Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
19. Damage Requiring Service – The appliance should be serviced by qualified service personnel when:
    A. The power-supply cord or the plug has been damaged; or
    B. Objects have fallen, or liquid has been spilled into the appliance; or
    C. The appliance has been exposed to rain; or
    D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
    E. The appliance has been dropped, or the enclosure damaged.
20. Servicing – The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

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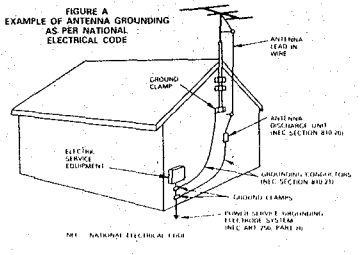

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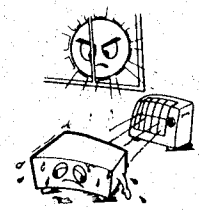
NOTE ON USE

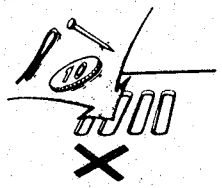


Be careful of high temperatures

- Do not place the set in a location where it will be exposed to direct sunlight or near a heating appliance.

Caution on rack/cabinet installation

- Avoid installing the set in a closed-type rack.
- When installing in a rack or cabinet, provide a sufficiently large ventilation opening to promote heat radiation.

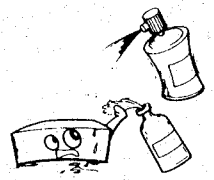


Do not allow foreign matter into the equipment

- Be especially careful of needles, hair pins, and coins getting into the set.

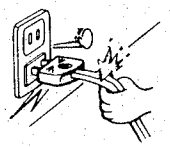
Caution on humidity, water, and dust

- Do not place the set in a location where there is high humidity or a lot of dust.
  Flower vases or other items containing water should not be placed on top of the set.



Care of the case

- Avoid the use of pesticides near the set as well as wiping the case with benzine, thinner or other solvents since they may cause a change in quality or color. Use a soft cloth when wiping away dirt and follow the instructions carefully when using chemically treated cloths.

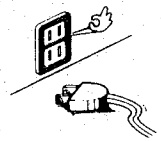


Care with the power cord

- When removing the plug from the receptacle, do not pull the power cord; be sure to hold the plug when removing it.

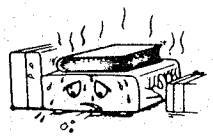
Do not open the case

- Opening the top cover or the bottom plate of the case and inserting your hand is dangerous. Do not open the case.
  If some trouble arises with the performance of the set, remove the power plug soon and contact the store where the set was purchased or a nearby dealer.



During your absence

- When not using the set for an extended period such as when taking a trip, be sure to disconnect the plug from the receptacle.



For sets with ventilation holes

Do not block the ventilation holes of the set

- Blocking of the ventilation holes will lead to damage of the set.
- The ventilation holes are very important for heat radiation from within the set. Care must be taken since placing an object against the holes will result in an extreme rise of temperature within the set.

Thank you very much for purchasing the DENON component. Stereo cassette tape deck.
DENON proudly presents this advanced tape deck to audiophiles and music lovers as a further proof of DENON's non-compromising pursuit of the ultimate in sound quality. The high quality performance and easy operation are certain to provide you with many hours of outstanding listening pleasure.

Please check to make sure the following items are included with the main unit in the carton:

(1) Operating Instructions 1
(2) Connection Cords 2
(3) Mini-Plug Cable 1

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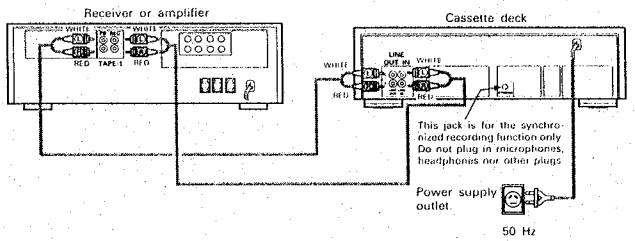
FEATURES

- Computer Controlled Mechanism
- Non-slip Reel Drive for Stabilizing Tape Tension
- Dual Power Supply
- High Performance R/P Head
- Dolby HX Pro System
- Dolby B & C Noise Reduction System
- Manual Bias Adjustment Control
- REC Return System
- Computing Tape Counter with 4-Digit Readout and Memory Stop
- Music Search System
- FL Peak Level Meters
- Auto Tape Selector
- Synchronized Recording
- Optional Remote Controllable
- DIMMER Adjustment

CONNECTION

- Leave your entire system (including this cassette deck) turned off until all connections between the deck and other components have been completed.



■ **Connecting the Deck to an Amplifier**

- Before connecting the deck to your amplifier, please review your amplifier's instruction manual.
- Use the white plugs for the left channel and red plugs for the right channel.

■ **Tape Dubbing**

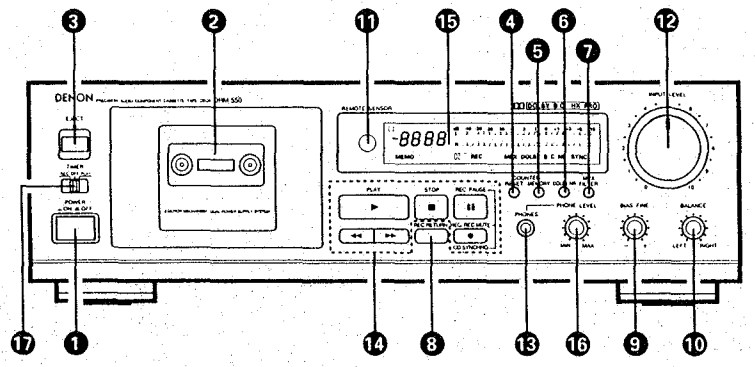
- Many stereo amplifiers and receivers have tape dubbing circuitry so that tape duplication can be performed between two or more tape decks. Review your amplifier's instruction manual for a full explanation of this mode of operation.

■ **Connecting Headphones**
To listen through headphones, plug your headphones into the PHONES jack.

■ **Installation Precautions**
If the deck is placed near an amplifier, TV or tuner, noise (induced hum) or beat interference may result, especially during FM or AM reception. If this occurs, place the deck further away from other components or reorient its position.

■ DIMMER Adjustment

NAMES AND FUNCTIONS OF PARTS



❶ **Power Switch (POWER)**
Controls the supply of AC power to the deck. One push turns the deck on, a second push turns it off. The deck remains in a stand-by (non-operative) mode for approximately 2 seconds after it is switched on.

❷ **Cassette Compartment Cover**
If this compartment cover is not closed completely, the deck's transport controls will remain inoperative.

❸ **Eject Button (EJECT ⏏)**
Press this button to eject the cassette. When the deck is operating (tape is running), press the STOP (■) button first to stop the tape transport, then press the EJECT button.

❹ **Counter Reset Button (COUNTER RESET)**
Operation of the button resets the counter to all zero.

❺ **Memory Button (COUNTER MEMORY)**
During rewinding operations, the tape will stop at the "0000" counter point automatically when this button is pressed in.

❻ **Dolby NR Button (DOLBY NR)**
To record or playback tapes with Dolby B or C-type noise reduction, set this button to "B" or "C". Turn it off when not using the Dolby NR system. If you further press the button during the display, the type will change in the following cycle.

→ OFF → B → C →

❼ **MPX FILTER Button (MPX FILTER)**
The MPX FILTER button, should be used to prevent interference with the Dolby NR circuit when making Dolby NR encoded recordings of FM stereo programs. When making Dolby NR encoded recordings from any program source other than FM stereo, leave this button in the "OFF" position.

❽ **REC Return Button (REC RETURN)**
When this button is pressed at the recording state, the tape is rewound to the starting point. When the starting point is automatically reached, the record standby mode (rec pause state) comes.

❾ **Bias Fine Control (BIAS FINE)**
(For NORMAL, HIGH and METAL tape)
Adjust the bias according to the tape characteristics. Standard biasing is obtained at the center click-stop position.

❿ **Balance Control (BALANCE)**
This is the knob to adjust the recording level balance between the left and right channels. Turn it counter-clockwise to reduce the right channel's level and clockwise to reduce the left channel's. Usually, put the knob at the center click position.

⓫ **Remote Sensor (REMOTE SENSOR)**
With the cassette deck the remote control unit is not included.
Each of "PLAY, FF, REW, STOP, REC PAUSE and REC/REC MUTE" functions can be remote controlled with wireless handset of the receiver (DRA Series receivers). For details refer to the DRA Series operating instructions.

⓬ **Input Level Control (INPUT LEVEL)**
The recording input level is adjusted by this knob. The levels in the left and right channels can be changed simultaneously.

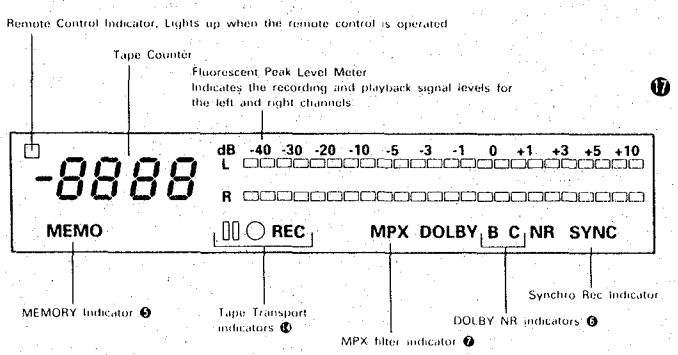
⓭ **Phones jack (PHONES)**
For private music enjoyment without disturbing others, or for monitoring a recording, a set of headphones may be plugged in. Impedance should be from 8 to 1200Ω/ohms.

Caution:
Whenever the power switch is in the OFF state, the apparatus is still connected on AC line voltage.
Please be sure to unplug the cord when you leave home for, say, a vacation.

⓮ **Tape Transport Buttons**

▶	Play Button	Press to playback tape.
■	Stop Button	Press to stop the tape in any mode.
◀◀	Fast Rewind Button	Press for fast rewind.
▶▶	Fast Forward Button	Press for fast forwarding.
● REC/REC MUTE	Rec/Rec Mute Button	Press the REC/REC MUTE (●) button and PLAY button simultaneously to start recording. If only the REC/REC MUTE (●) button is pressed, the deck enters the Recording Pause mode. Pressing this button in the Recording Pause mode will start Auto Rec Mute, and a 5-second silent space is recorded onto the tape.
II REC PAUSE	Rec Pause Button	Press this button to enter the recording pause mode from the recording or recording mute mode. This button can only be used during recording.

⓯ **Display**
Indicators with an encircled number light up when the corresponding button is pressed.

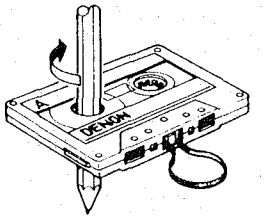


⓰ **Phone Level Control (PHONE LEVEL)**
Head phone output level is adjusted by this knob. The levels in the left and right channels can be changed simultaneously.

⓱ **Timer Switch (TIMER)**
This switch is provided for use with an optional audio timer for unattended recording or morning-alarm playback. For non-timer operation, this switch should be set in the "OFF" position.
See page 12.

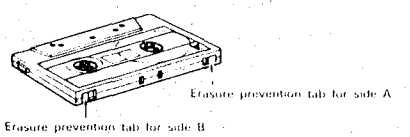
CASSETTE TAPE

■ Handling Precautions
- C120 Cassettes
  C120 cassette are not recommended as they use a very thin tape base which may become tangled around the capstan or pinchroller.
- Tape Slack
  Before putting a tape into the deck, take up any slack with a pencil or your finger tip. This precaution is also to prevent the tape from becoming entangled around the capstan or pinchroller.



■ Storage Precautions
- Do not store cassette tapes in a place where they will be subject to:
  - Extremely high temperature or excessive moisture
  - Excessive dust
  - Direct sunlight
  - Magnetic fields (near TV set or speakers)
- To eliminate tape slack, store your cassettes in cassette cases with hub stops.

■ Accidental Erasure Prevention
- Every cassette has erasure prevention tabs for each side. To protect your valuable recorded tapes from accidental or inadvertent erasure, remove the tab for the appropriate side with a screwdriver or other tools.
- To record on a tape with the erasure prevention tabs removed, cover the tab holes with plastic tape.



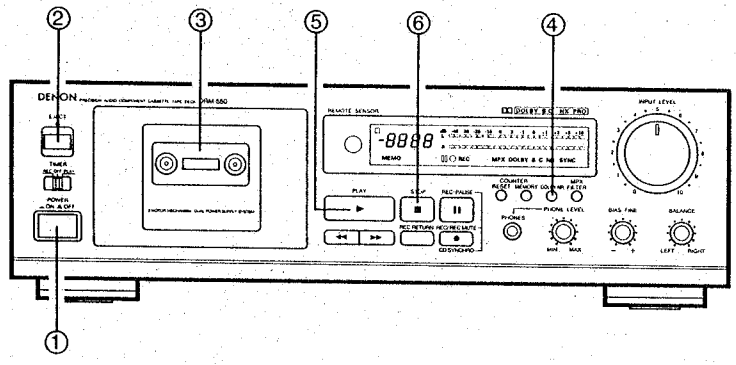
AUTO TAPE SELECT FEATURE

This Stereo Cassette Deck contains an Auto Tape Select feature which automatically selects the optimum bias and equalization for the tape in use. This is accomplished by detection of tape type detection holes in the cassette housing.

- If a tape without tape type detection holes is used, the deck will automatically adjust itself for normal tapes.

PLAYBACK

- Switch on your amplifier or receiver.
- Set the Tape Monitor switch on your amplifier or receiver to the TAPE position.
- The numbers in the illustration below depict the order in which operation steps are carried out.



① Press the POWER switch to the ON (▬) position.

② Press the EJECT (⏏) button to open the cassette compartment cover.

③ Load the cassette tape and close the cassette compartment cover.

④ When listening to a tape that has been recorded with Dolby noise reduction, set the DOLBY NR button to match the system used at the time of recording.
Pressing the DOLBY NR button selects Dolby noise reduction type B (and the "B" indicator lights up).
One more press of the DOLBY NR button selects Dolby noise reduction type C (and the "C" indicator lights up).
Pressing the DOLBY NR button once again switches Dolby noise reduction off.

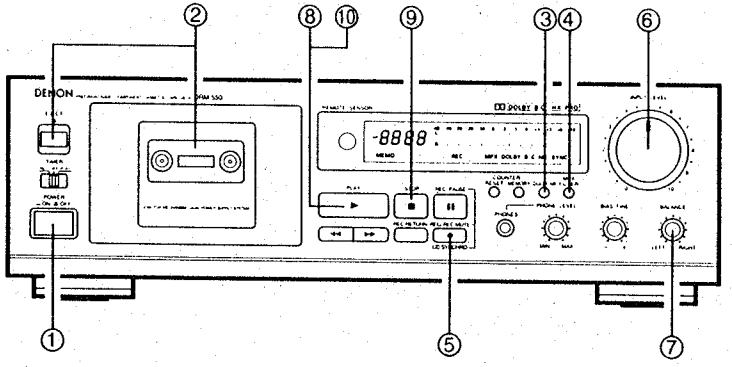
→ Dolby NR off → Dolby NR type B → Dolby NR type C →

⑤ Press the PLAY (▶) button to begin playback. The " ▷ " indicator will light during playback.

⑥ Press the STOP (■) button to stop the playback.
- If different types of Dolby noise reduction are used for record and playback, playback response will be adversely effected.
- When power is turned off during tape transport, it may not be possible to remove the cassette by pressing the EJECT (⏏) button. In this case, turn on power again before you press the EJECT (⏏) button.

RECORDING

- Switch on your amplifier or receiver and the source component.
- Set the Tape Monitor switch on your amplifier or receiver to the SOURCE position.



① Press the POWER switch to the ON (▬) position.

② Load the cassette tape.
(Check that the erasure prevention tabs of the cassette housing have not been broken off.)

③ Press the DOLBY NR button and select the Dolby NR type that suits the recording.

Recording without Dolby NR ←
↓
Recording with Dolby NR type B
(The "B" indicator will light up.)
↓
Recording with Dolby NR type C
(The "C" indicator will light up.)

④ Turn the MPX FILTER button on to record FM broadcasts in Dolby NR.
The "MPX" filter indicator will light up.

⑤ Press the REC/REC MUTE (●) button to set the recording pause mode. The " ▯○REC " indicator will light up.

⑥ Adjust the recording level with the INPUT LEVEL control while watching the Peak Level Meter

⑦ Use the BALANCE control knob to adjust the balance of the left and right channel recording input level.

⑧ Press the PLAY (▶) button to start the recording.
The " ▷ " and the " ○REC " indicator will light during recording.

⑨ To pause the recording, press the REC PAUSE (❚❚) button.
Press the PLAY (▶) button to resume recording.

⑩ To stop recording, press the STOP (■) button.

Caution:
- Be careful not to erase important recordings by mistake. Inadvertent start of recording will happen in the following cases:
  1. If the PLAY (▶) button is pressed while the " ○REC " indicator lights, recording starts.
  2. If the PLAY (▶) and REC/REC MUTE (●) button are pressed at the same time, recording starts.

  The best way to avoid accidental erasure is to break off the two erasure prevention tabs on the cassette housing.
- Always press the STOP button before turning off the power during recording.

PROPER RECORDING LEVEL

A too high recording level can saturate the tape and cause distortion. On the other hand, if the recording level is set too low, soft passages will be marked by residual noise. A proper recording level is the single most important factor for making well balanced recordings.

Guideline for maximum recording level

TYPE I (Normal)	+1 dB level on peaks
TYPE II (High)	+3 dB level on peaks
TYPE IV (Metal)	+5 dB level on peaks

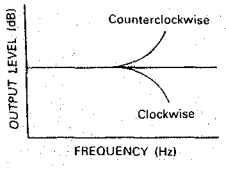
Note: The optimum recording level differs depending on the program source and the type of tape used.

RECORDING BIAS ADJUSTMENT

For best recording results, monitoring during recording and comparing different recordings using your own judgement are essential.
The DENON cassette deck is equipped with a BIAS FINE control to assist you in setting the proper bias for different types and brands of tape. At the center stop-click position, the deck is set to the reference bias level for Normal, High and Metal tape. If the resulting recording in this position has too much or too little high frequency content, adjusting the BIAS FINE control can be useful to achieve better results.

BIAS FINE

If the high frequencies (treble sounds) are to be boosted, turn the BIAS FINE control counter-clockwise to decrease the bias current. Turn the control clockwise to increase bias current.
By the use of this control, you can record tapes with a frequency response that will perfectly match your listening taste.

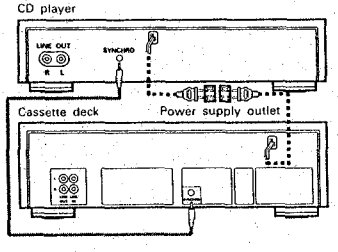


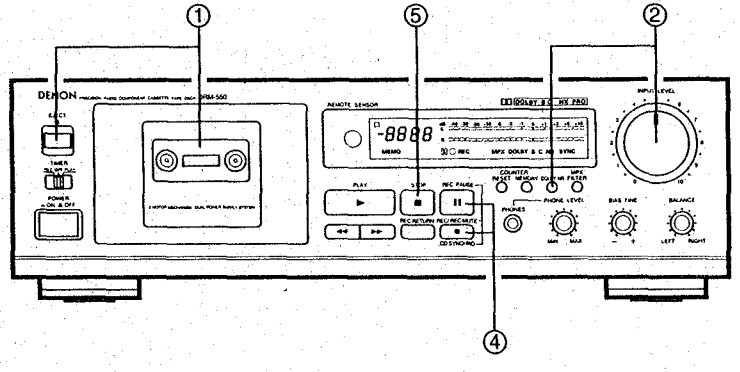
REC / REC MUTE AND REC PAUSE Button

1. To record a 5-second blank section during recording:
   Press the REC/REC MUTE (●) button. A 5-second blank will be recorded and the deck will enter the recording standby mode.
2. To record a 5-second blank section during the recording standby mode:
   Press the REC/REC MUTE (●) button from the recording standby mode. A 5 second blank will be recorded and the deck will enter the recording standby mode again.
3. To cancel recording of blank space:
   Press the REC PAUSE (II) button. Blank space recording will be cancelled and the deck enters the recording standby mode.
4. To extend the blank section with another 5 seconds or more:
   Simply press the REC/REC MUTE (●) button and the blank section will be increased with another 5 seconds.

SYNCHRONIZED RECORDING FUNCTION

- Convenient synchronized recording can be performed when used in combination with a DENON CD player equipped for the synchronized recording function.
- SYNCHRO Jack Connection Connect the SYNCHRO Jack with a DENON CD player which is equipped with a SYNCHRO jack, then make a synchronized recording. Use the connection cord supplied with this cassette deck
- Switch on your amplifier or receiver and the CD player.
- Set the tape Monitor switch on your amplifier or receiver to the source position.



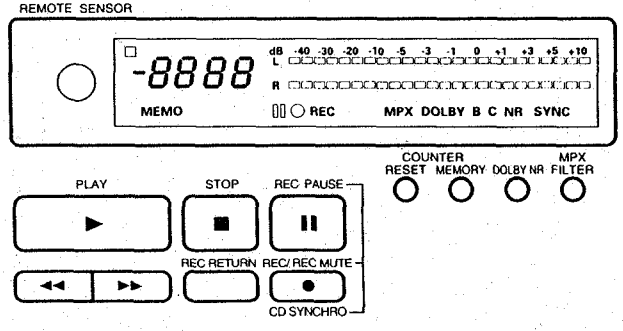


① Load the tape, the disc you want to record into the CD player.
② Following the recording instructions on page 9, set the Dolby NR mode, and the input level.
③ Set the CD player to the stop or pause mode.
④ Press the REC/REC MUTE (●) button and REC PAUSE (II) button simultaneously. The cassette deck and CD player are automatically set to the synchronized recording mode. The "SYNC" indicator flashes on the cassette deck and the synchronized recording mode is indicated on the CD player. (For details, refer to the CD player's operating instructions.)
⑤ To stop synchronized recording, press the stop button. The synchronized recording mode is cancelled for both the cassette deck and CD player.
⑥ To stop synchronized recording temporarily, press the stop button on the CD player. A 5-second blank space is created on the tape, after which the recording pause mode is set. The "SYNC" indicator flashes.
To resume synchronized recording, press the PLAY button on the CD player.

Note:
- If synchronized recording is started when the CD player is in a mode other than the stop or pause mode or when no disc is set, the "SYNC" indicator on the cassette deck flashes and the recording pause mode is set until synchronized recording is possible on the CD player.
- In the synchronized recording mode, only the STOP button will function.

Caution:
- Do not set the cassette deck to the synchronized recording mode when the CD player is in the play mode. Also, do not turn off the power of the cassette deck or the CD player during synchronized recording. Doing so can result in malfunction.
- During the editing operation, when using the editing functions on the CD player, be sure to select a tape with a sufficiently long recording time.

TAPE COUNTER AND MEMORY STOP



1) Operation of the Tape Counter
(1) Press the RESET button to reset the counter to " 0000 ".
(2) By using the PLAY, FF, or REW functions, the reading of the counter will change to indicate index position.
- During recording and playback operations, the counter is useful for noting the location of existing programs or positions where recording is to be started.
- The reading of this counter does not correspond with that of any other deck.

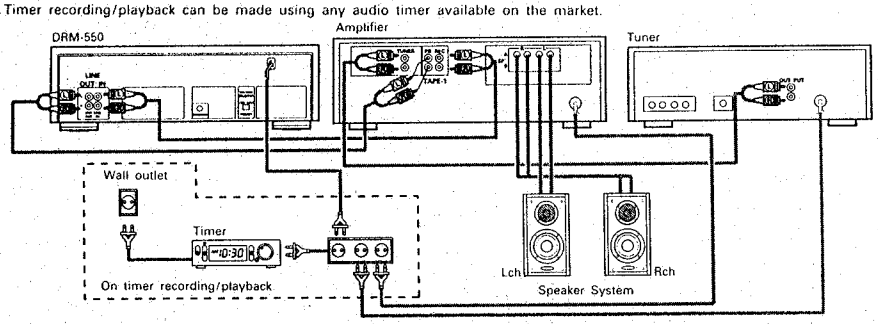
2) MEMORY STOP Operation
(1) During recording or playback, the Memory Stop feature can be used to locate a particular point on the tape. Press the COUNTER MEMORY button at the desired point.
(2) The "MEMO" indicator lights.
(3) When the Rewind (◀◀) button is pressed, the tape is rapidly rewound until the counter indication of " 0000 " is reached.
- The Memory Stop feature will rewind the tape to within –5 counts (from " 0000 " to " -0005 "). After this, several seconds are required for corrective operations.

3) Display Back-up
The functions DOLBY NR, MPX FILTER and the counter content are protected by 24-hour memory back-up. After 24 hours DOLBY NR and MPX FILTER are set to "OFF" and the counter content is reset to " 0000 ".

Caution:
If the memory stop operation is performed after repeated fast-forwarding or rewinding, the tape may not stop at the proper position.

TIMER RECORDING / PLAYBACK

Timer recording/playback can be made using any audio timer available on the market.



- **Timer recording procedure**

1. Make sure the connections are correct, especially the power supply connections.
2. Turn "on" the power switch of each appliance.
3. Tune the desired station on the tuner.
4. Load the tape for recording. (Make sure the erase prevention tab is not broken off; if it is, cover the hole with plastic tape).
5. Set the Dolby NR button to the appropriate position.
6. Make sure the monitor switch to the SOURCE position.
7. Adjust the recording input level.
8. Set the starting position of the tape.
9. Set the timer switch (TIMER) to the "REC" side.

TIMER

REC OFF PLAY

10. Set the audio timer to the desired time. The audio timer will turn the power supply on at the desired time.

* With the above procedures, timer controlled recording can be made. When the preset time comes, the power is supplied and the FM broadcast can be recorded.

- **Timer playback procedure**

1. Make sure the connections are correct, especially the power supply connections.
2. Turn "on" the power switch of each appliance.
3. Load the pre-recorded tape to be played back.
4. Set the Dolby NR switches to the appropriate positions.
5. Set the monitor switch of the Amplifier to the TAPE position.
6. Press the PLAY (▶) button and playback the tape; adjust the playback level.
   Press the stop (■) button.
7. Set the timer switch (TIMER) to the "PLAY" side.

TIMER

REC OFF PLAY

8. Set the audio timer to the desired time. The audio timer will turn the power supply on at the desired time.

* With the above procedures, timer playback can be accomplished. When the preset time comes, the power is supplied and playback will start.

Note:

- Please read the operating instructions for the timer before use.
- If the timer recording or playback is not desired, be sure to switch the timer switch (TIMER) to "OFF".
- When using timers that allow several "on/off" operations, timer start functioning can continue an unlimited number of times until the tape in the machine is finished.

DIMMER ADJUSTMENT

With the DRM-550, the brightness of the display can be adjusted in seven steps.
To make the display brighter, press the fast forward (▶▶) button while holding the STOP button.
To make the display dimmer, press the fast rewind (◀◀) button while holding in the STOP button.
The display is initially set to the maximum brightness.

MUSIC SEARCH SYSTEM

This device is a convenient system which detects the non-recorded part of more than 4 seconds between melodies, cues the next melody while the present melody is being reproduced or automatically detects the beginning of the melody now being reproduced and makes it into the reproduceable state.

1. For cueing the next melody while the present melody is being reproduced:
   Press the PLAY button, keep it pressed in, and press the Fast Forward (▶▶) button. The tape transport indicator (⋮) flashes. This device will detect the interval between melodies with the CUE state on, automatically become the PLAY mode and begin performing the next melody.
2. For hearing again the melody now being reproduced:
   Press the PLAY button, keep it pressed in, and press the Rewind (◀◀) button. The tape transport indicator (⋮) flashes. This device will detect the interval between melodies with the REVIEW state on, automatically become the PLAY mode, detect the beginning of the melody now being performed and play it from the first again.

Note: Note about MUSIC SEARCH action.
MUSIC SEARCH is a function which operates by detecting a comparatively long non-recorded part on the tape. Therefore, MUSIC SEARCH may not operate normally in the following cases.

- Sound on the tape is interrupted by speech or conversation.
- Long periods of pianissimo (softly played music) or non-recorded intervals occur on the tape.
- The tape has picked up noise in a non-recorded interval.
- Non-recorded intervals on the tape are less than 4 seconds in length.
- Noise-emitting electrical appliances are in operation nearby. i.e.; Electric razors, drills, refrigerators, etc.

DOLBY B AND C NOISE REDUCTION SYSTEM

■ The Dolby noise reduction system substantially reduces the tape background noise (hiss) inherent in the cassette medium. Dolby B NR is most widely in use. However Dolby C NR is a much more recent development and represents significant improvements over Dolby B NR.

■ Tape background noise consists primarily of high frequency information, which is particularly annoying during soft passages. The Dolby NR system increases the level of low-volume mid- and high-frequency signals during recording and reduces the level of these signals by an identical amount during playback. As a result, the playback signal is identical to the original source, but the level of background noise generated by the tape is greatly reduced.

■ The operating principle of Dolby C NR is similar to that of Dolby B NR except for the encoding/decoding response curves. The noise reduction effect obtained with Dolby C NR is up to 20 dB, compared to 10 dB with Dolby B NR. In addition, Dolby C NR uses an anti-saturation network and spectral skewing circuitry for a significant improvement in the dynamic range of the mid- to high-frequencies.

DOLBY HX-PRO HEADROOM EXTENSION SYSTEM

This deck is equipped with the Dolby HX-PRO headroom extension system. Since the system functions automatically during recording, no switching operation or adjustment is required. The system is effective with any type of Normal, High and Metal tape. The Dolby HX-PRO headroom extension system functions during recording to raise the saturation level in the treble range. Therefore, most of the treble range components distorted or lost during recording on conventional cassette decks are more faithfully recorded on the new DENON cassette deck.

Features of the Dolby HX-PRO Headroom Extension System

(1) Performance of Normal and High tapes can be improved to very close of that offered by Metal tape.
(2) The dynamics in the treble range are improved significantly.
(3) Since no decoding is necessary during playback, the improved sound can be enjoyed on any type of tape deck, including portable players and car audio systems.
(4) The system functions whether the Dolby B/C NR system is engaged or not.

MAINTENANCE

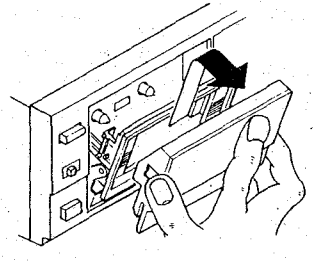
■ Removing the cassette compartment cover

It will be more convenient if the cassette compartment cover is removed during the cleaning of the pinchroller and heads, or during demagnetizing of heads.

Follow these procedures:

1. Press the EJECT button to open the cassette compartment.
2. Hold only the cover of the cassette compartment and pull it up. The compartment cover is removed from the front.

When attacing the cassette compartment cover, reverse the above procedure.

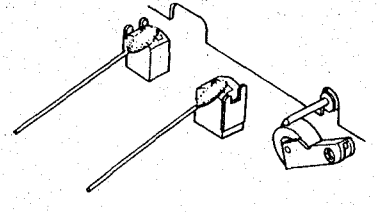


■ Head cleaning

After long usage, tape coating or dust may adhere to the heads, causing deterioration of sound. Clean them regularly. Use a cotton swab moistened with cleaning solution (such as alcohol).

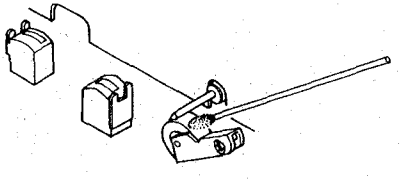
Note:

1. Some cleaning cassettes on the market have a strong abrasive effect and scratch the heads. Use cotton swabs instead of cleaning cassettes.
2. Since the use of metal tapes is apt to collect more dust on the heads, clean the heads more often to enjoy optimum sound.



■ Cleaning the pinchrollers and capstans

If the pinchroller or capstans accumulate dust, tape transport may become unstable resulting from slippage during recording or playback. The tape can also be damaged by being rolled up around the capstan.
Clean them with a cotton swab or a soft cloth moistened with cleaning solution (such as alcohol).



■ Demagnetizing the heads

The heads may become magnetized after long usage or by having a strongly magnetized object brought near them. The result is a generation of noise, loss of the high frequency range, or erasing the treble components of pre-recorded tapes and adding noise.
Demagnetize the heads on a regular basis.

■ Procedure

1. Be sure to turn "off" the power supply.
2. Turn the demagnetizer "on" while it is more than 30 cm away from the heads. Bring the demagnetizer near the heads and slowly move it in a small circle four or five times.
3. Slowly move the demagnetizer away from the heads and turn "off" the power of the demagnetizer when it is about 30 cm away from the heads.

TROUBLESHOOTING

Make sure of the following before you consider as any malfunctions.

1. Are all the connections correct?
2. Is the set being operated correctly in accordance with the operating instructions?
3. Are the speakers and amplifiers functioning correctly?

If the tape deck still does not function properly, check it again, using the check list below. If the symptom does not correspond to the check list, please contact your DENON dealer.

Problem	Cause	Remedy
Tape does not run.	• Power cord is off. • Tape is completely wound up. • Tape is loose. • Cassette is not loaded properly. • Defective cassette.	• Check power cord. • Rewind tape. • Tighten tape with a pencil, etc. • Load cassette properly. • Replace cassette.
Tape is not recorded when recording button is pressed.	• No cassette is loaded. • Erase prevention tab is broken off.	• Load cassette. • Cover hole with plastic tape.
Sound is warbled or distorted.	• Heads, capstan or pinchroller are contaminated. • Tape is wound too tight. • Recording input level is too high. • Tape is worn out and has "drop-outs".	• Clean them. • Fast forward or rewind to loosen tape winding. • Adjust recording input level. • Replace tape.
Excessive noise.	• Tape is worn. • Heads, capstan or pinchroller are contaminated. • Heads are magnetized. • Recording input level is too low.	• Replace tape. • Clean them. • Demagnetize heads. • Adjust recording input level.
High frequency (treble) is emphasized.	• Dolby NR button is set improperly.	• Set Dolby NR button properly.
High frequency (treble) is lost.	• Heads are contaminated. • Tape is worn.	• Clean them. • Replace tape.
The cassette tape cannot be removed.	• If the power switch is turned off in either the recording or playback mode, and the unit is stopped, there may be case when the cassette cannot be removed, even if the EJECT button is pressed.	• Turn the power switch ON again, and then press the stop (■) button. • Then, in the stop mode, press the EJECT button to remove the cassette tape.

SPECIFICATIONS

Type	Vertical tape loading; 4-track 2-channel stereo cassette deck
Heads	Record/Playback (R/P head) × 1 Erase head (Double-gap ferrite head) × 1
Motors	Capstan (DC servo motor) × 1 Reel (DC motor) × 1
Tape Speed	4.8 cm/sec.
Fast Forward, Rewind Time	Approx. 110 sec. with a C-60 cassette
Recording Bias	Approx 105 kHz
Overall S/N Ratio (at 3% THD level)	Dolby C NR on: more than 74 dB (CCIR/ARM)
Overall Frequency Response	25 ~ 18,000 Hz ±3 dB (at −20 dB, Metal tape)
Channel Separation	More than 40 dB (at 1 kHz)
Crosstalk	More than 65 dB (at 1 kHz)
Wow & Flutter	0.055% WRMS, ±0.14% w. peak
Inputs	
line	80 mV (−20 dBm) input level at maximum Input impedance: 50 kΩ/kohm unbalanced
Outputs	
line	775 mV (0 dB) output level at maximum (with 47 kΩ/kohm load, recorded level of 200 pwb/mm)
headphones	1.2 mW output level at maximum (optimum load impedance 8 Ω/ohm ~ 1.2 kΩ/kohm)
Power Supply	230 V 50 Hz
Power Consumption	16 W
Dimensions	434 (W) × 135 (H) × 270 (D) mm (17-3/32" × 4-59/64" × 10-53/64")
Weight	3.8 kg (8 lbs 6 oz)

* Design and specifications are subject to change without notice in the course of product improvement.

Best results will be obtained with use of DENON GR Series cassette tapes.

Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.

"DOLBY", the double-D symbol DD and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

DISASSEMBLY INSTRUCTIONS

1. How to Remove the Front PANEL A'ssy

(1) Remove the six screws (4×10CBTS(P)-B) (104) in the side of the top cover (36). Move the top cover to the rear and rise it to remove it.

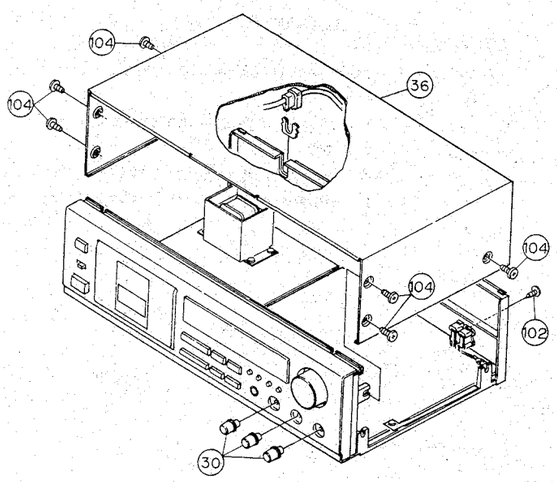
(2) Disconnect all lead connectors.

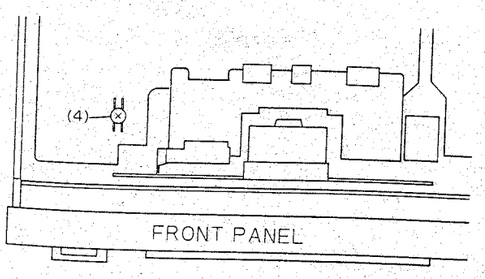
C. MECHA	ERASE Head wire → CB143	POWER
	PB/REC Head wire → CB141	AUDIO
DISPLAY	CW-253 → CB253	POWER
	CW121 → CB121	AUDIO
	CW122 → CB122	
VR	CW131 → CB131	
SW	CW-254 → CB254	POWER
POWER	CW191 → CB191	AUDIO
	CW255 → CB255	C. MECHA

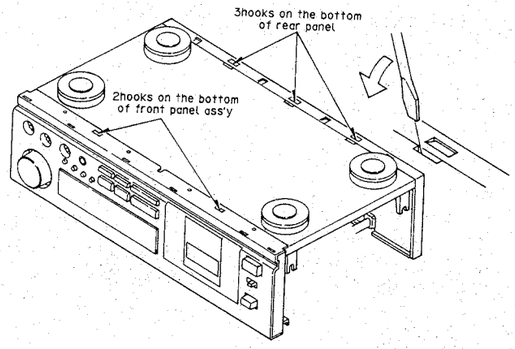
(3) Remove the Volume knob (30).

(4) Remove the screw (3X8CBTS(S)-B) (101).

(5) Remove the two Hooks on the bottom, Front Panel Ass'y can be removed towards the front.







2. How to Remove the Cassette Mechanisms

Remove the four mechanism retaining screws (3X8CBTS(P)-B) (102), and take out C. Mechanism.

3. How to Remove the Display P.W. board

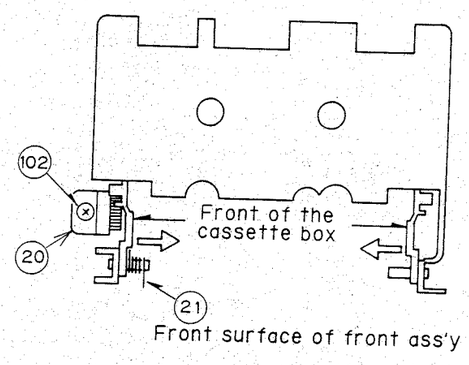
(1) DISPLAY { CW251 → CB251, CW252 → CB252 } C. MECHA

(2) Remove the seven Display P.W. board retaining screws (3X8CBTS(P)-B) (102) and take out the Display P.W. board.

4. How to Remove the Cassette Door

(1) Remove the Mini Damper (20) retaining screw (3X8CBTS(P)-B) (102) and take out the Mini Damper (20).

(2) Hold the legs of the CASSETTE BOX folded inwards and pull up to remove the CASSETTE BOX (18) and BOX SPRING (21).



5. How to Remove the Rear panel

(1) Remove the top cover (36) and front Panel. Ass'y. (Refer to section 1.)

(2) Remove the screw (3X8CBTS(P)-B) (102) that is holding the 4P pin jack.

(3) Remove the busing (7) (8) that is fixing AC cord from rear panel (9).

(4) Remove the three hooks on the bottom of rear panel (9) and pull the unit back to detach it.

6. How to Remove the Audio P.W. Board

(1) Remove the top cover (36) and the front esc. Ass'y. (Refer to section 1.)

(2) Remove the screw (3X8CBTS(P)-B) (102) that is holding the 4P pin jack.

(3) Remove the connectors from the audio P.W. board and power P.W. board.

power P.W. board CW191 → CB191 audio P.W. board

(4) Remove the six screws (3X8CBTS(P)-B) (102), the audio P.W. board can be removed by rising it.

7. How to Remove the Power Supply P.W. board

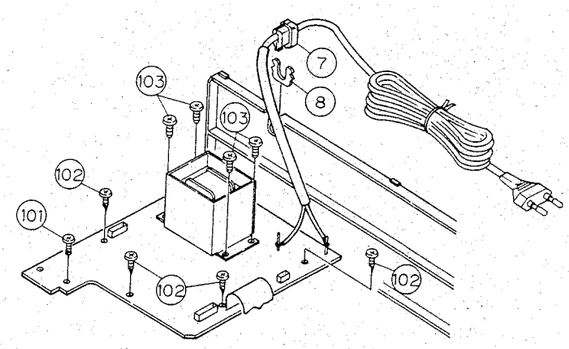
(1) Remove the top cover (36). (Refer to section 1.)

(2) Remove the busing (7) (8) that is fixing AC cord from rear panel (9).

(3) Remove the connectors from the audio P.W. board and power P.W. board.

power P.W. board CW191 → CB191 Audio P.W. board

(4) Remove the nine screws (4X10CBTS(P)-Z) (103), (3X8CBST(P)-B) and (3X8CBTS(S)-B) (102) that are holding the power transformer and P.W. board. The power P.W. board can be removed by rising it.



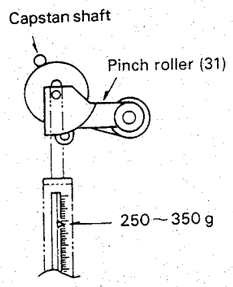
ADJUSTING AND CHECKING THE MECHANISM SECTION

1. Replacing the Pinch Roller (31)

Before replacing the pinch roller, clean the tape contact surface of the pinch roller and the capstan shaft.
Most causes of poor tape transport can be traced to dirty pinch roller and capstan shaft.
Remove the clips that press the pinch roller and pull the pinch roller forward to remove it.
After replacing, run a padless C-90 tape to check for tape curls at the tape guide section of the head.

2. Checking the Pressure Force of the Pinch Roller (31)

In the playback mode, hook a spring weight onto the bracket at the center of the pinch roller. After separating the pinch roller from the capstan shaft, allow the pinch roller to contact the capstan shaft again. Check to make sure the spring weight reads between 250 ~ 350 g when the pinch roller starts to rotate.
Replace the pinch roller (36) when it does not conform to the standard specification values.



3. Replacing the Record/Playback Head (3-9)

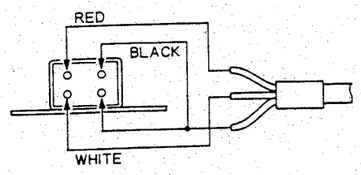
(1) How to remove the R/P HEAD.
  1) Remove securing screw and azimuth adjusting screw (1) from the record/playbak head.
  2) Remove the soldered head wire and disassemble the mechanical unit to remove the record/playbak head.

(2) How to assemble the R/P HEAD.
  Reverse the above (1) procedures for removing the R/P HEAD.

• Solder the HEAD WIRE according to the diagram.

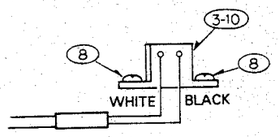
mechanism (recording/playback head)

(2) Remove the three retaining screws 3 ×10 CBTS-(P)-B (51) holding the Front Escutcheon at the front.



4. Replacing the ERASE HEAD (3-10)

(1) Unscrew the erase head holding screws (8).
(2) By unsoldering the HEAD WIRES can be taken off the mechanism unit.
(3) When the replacement is completed, secure the screws with the screw lock.



5. Checking the Take-up Torque

Load the cassette type torque meter (SONY TW2111).
Check to make sure that the average torque meter reading is within 30-70 g-cm during playback. If it is not within this range, check the voltage (approx. 4V) of the reel motor. If the voltage is low, the torque will be weak: if it is high, the torque will be strong.

6. Checking the FF and REW Torques

Load the cassette type torque meter (SONY TW2231). Check to make sure the torque meter indicates within 90 ~ 180 g-cm at the end of FF and REW.

7. Checking the Back Tension Torque During Record/Playback

Load the cassette type torque meter (SONY TW2111); check to make sure the torque meter reads between 2 ~ 6 g-cm during playback and that there is no unevenness.
If it is not within this range, replace the reel ass'y (5) or Washer.

8. Checking the FF and REW Times

Load a C-60 cassette tape (DENON GR-2/60); check to make sure the tape is fast forwarded or rewound within 110 seconds. if it is not within this range, check sections 5 and 6.

9. Checking the Existence of a Cassette Housing and the Operation of the Erase Prevention, Metal and Chrome Switch

Confirm that the sensor arm properly detecting the tape type detection holes on the cassette housing.

ADJUSTING AND CHECKING THE ELECTRICAL SECTION

• Caution on adjusting

(1) Before adjusting, clean the head surface, capstan and the pinch roller with a gauze or a cotton swab moistened with alcohol.
(2) Demagnetize the R/P HEAD and the E. HEAD with a head eraser.
(3) Completely demagnetize the adjustment screwdriver.
(4) Unless instructed otherwise, set the various controls as follows.
  ○ INPUT volume ..... maximum
  ○ DOLBY NR switch ..... OFF
  ○ BIAS FINE volume ..... Center click position
  ○ BALANCE volume ..... Center click position

1. Tape Transport Check

Load the transport check cassette. In the operational mode, illuminate the fixing guides of the R/P HEAD with a lamp and check to make sure the tape edge does not come in contact with the tape guide section.
The tape transport is the most important element in determining the performance of a cassette deck.
Avoid moving the various adjustment screws, nuts, etc., as much as possible. Refer to the pages on "Adjusting and Checking the Mechanism Section" when replacing or adjusting the R/P HEAD.

2. Adjusting the Azimuth

(1) After completing the tape transport check, load the test tape (A-BEX TCC-153). **Fig. 2-1**
(2) Playback the test tape; adjust the azimuth screw so that section A of the resurge wave form is maximum and section B is minimum. **Fig. 2-2**

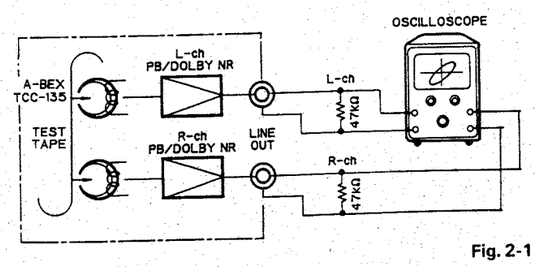


Fig. 2-1

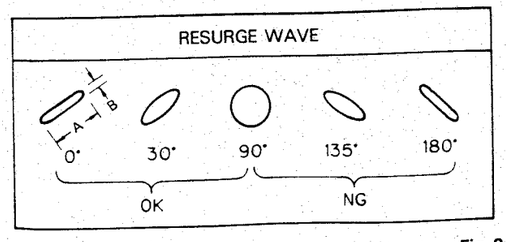


Fig. 2-2

EQUIPMENT FOR ADJUSTING AND CHECKING

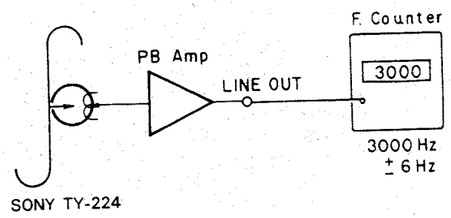
1) MEASURING TAPE

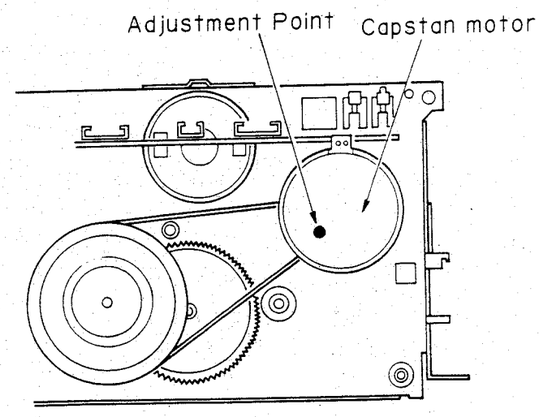
TYPE NAME	BRAND	TYPE NAME, BRAND AND USES USES
TW-2111A/2121A	SONY	Checking the Take-up Torque and Back Tension.
TW-2231	SONY	Checking the FF and REW Torque.
GR-2/60	DENON	Checking the FF and REW Tirhes.
TCC-153	A-BEX	Adjusting the Azimuth.
TY-224	SONY	Checking and Adjusting the Tape Speed.
TCC-130	A-BEX	Adjusting the Playback Level.
TCC-162/262B	A-BEX	Checking the Playback Frequency Response.
TCC-902	A-BEX	Transport checking cassette tape.

2) MEASURING INSTRUMENT
  Tension gauge
  Audio signal generator
  Variable resistance attenuator
  Electronic voltmeter
  Oscilloscope
  Frequency counter
  Adjustment screwdriver
  Trap coil adjustment square stick

3. Checking and Adjusting the Tape Speed

(1) Connect the frequency counter to the LINE OUT terminal and load test tape (SONY TY-224).
(2) Playback a test tape. At about halfway through the tape, where the tape transport is stable, adjust the adjustment points on the back of the capstan motor so that the frequency counter will have a reading within the range of 3,000 Hz ±6 Hz.





4. Adjusting the Playback and Recording Section

Procedure	Item	Usage tape — input condition	Response	Mode	Adjustment location	Adjustment procedure
1	PLAYBACK GAIN	A-BEX TCC-130	Fig. 4-1	PLAYBACK	RT-101 (L) RT-101 (R)	Adjust the LINEOUT output to 775 mV (0 dBs).
2	P.B. Frequency	A-BEX TCC-162B, 262B	Fig. 4-1	PLAYBACK		Make sure the playback characteristics conform to Figure 4-2.
3	REC/P.B. Frequency	GR-2/C60 1 kHz, −40 dB 10 kHz, −40 dB	Fig. 4-2	REC. PLAY ↓ PLAYBACK	RT-105 (L) RT-205 (R)	Record 1 kHz and 10 kHz alternately. Adjust each volume so the 10 kHz playback output is 0.5 dB in relation to the 1 kHz playback output.
4	REC GAIN	GR-2/C60 1 kHz, −30 dB	Fig. 4-2	REC. PLAY ↓ PLAYBACK	RT-103 (L) RT-203 (R)	Adjust each volume to the playback output is the same as when the recording monitor is output.
5	REC/P.B. Frequency	GR-2/C60 Dolby NR C	Fig. 4-3	REC. PLAY ↓ PLAYBACK		Make sure that the DOLBY NR C recording and playback characteristics conform to Figure 4-3.

Playback Frequency Response

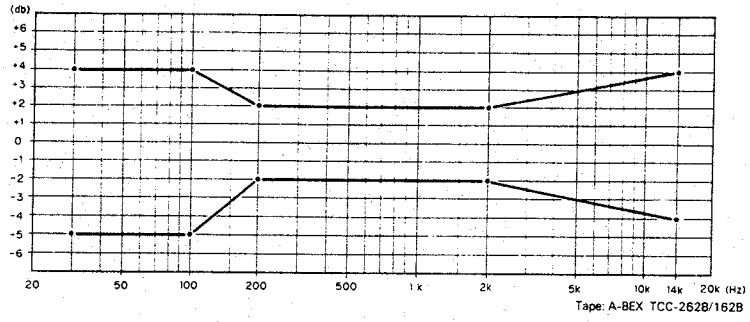


Fig. 4-1

Record/Playback Overall Frequency Response

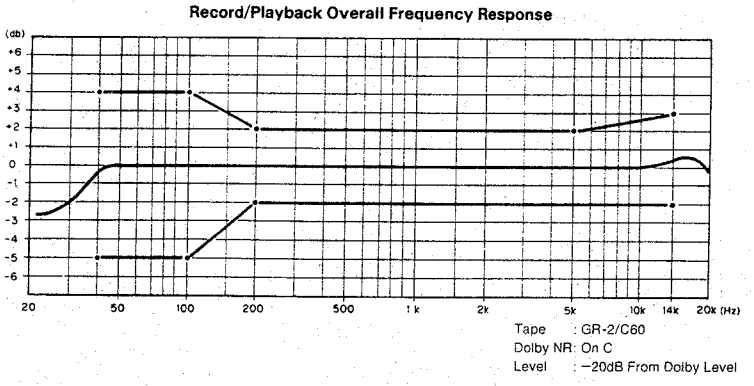


Fig. 4-2

Dolby C Record/Playback Overall Frequency Response

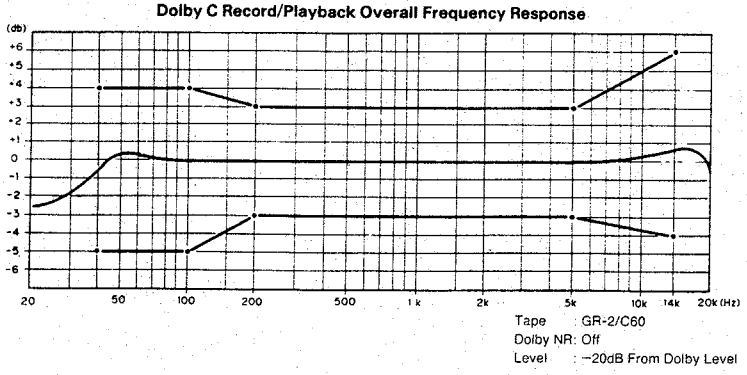
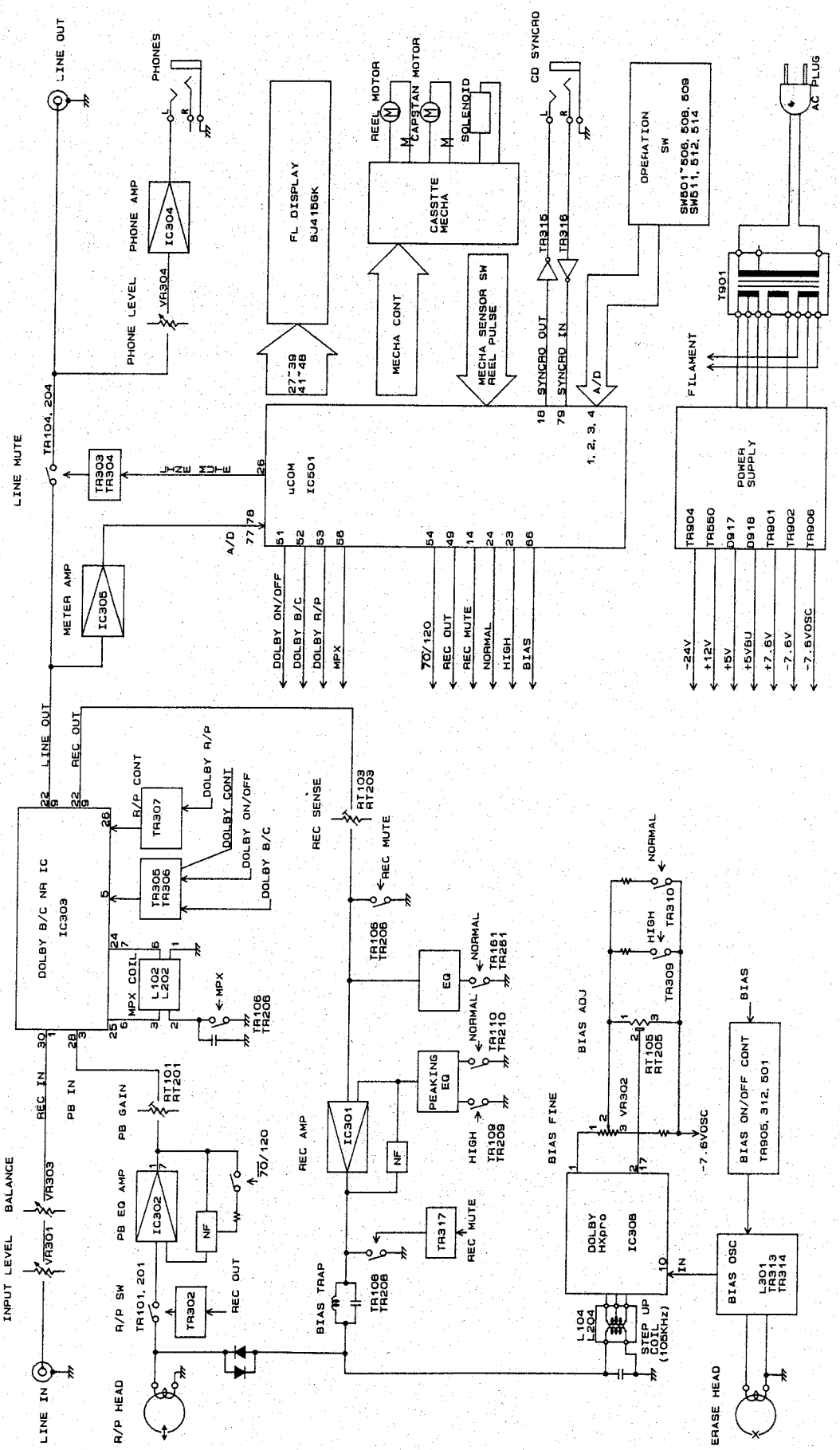


Fig. 4-3

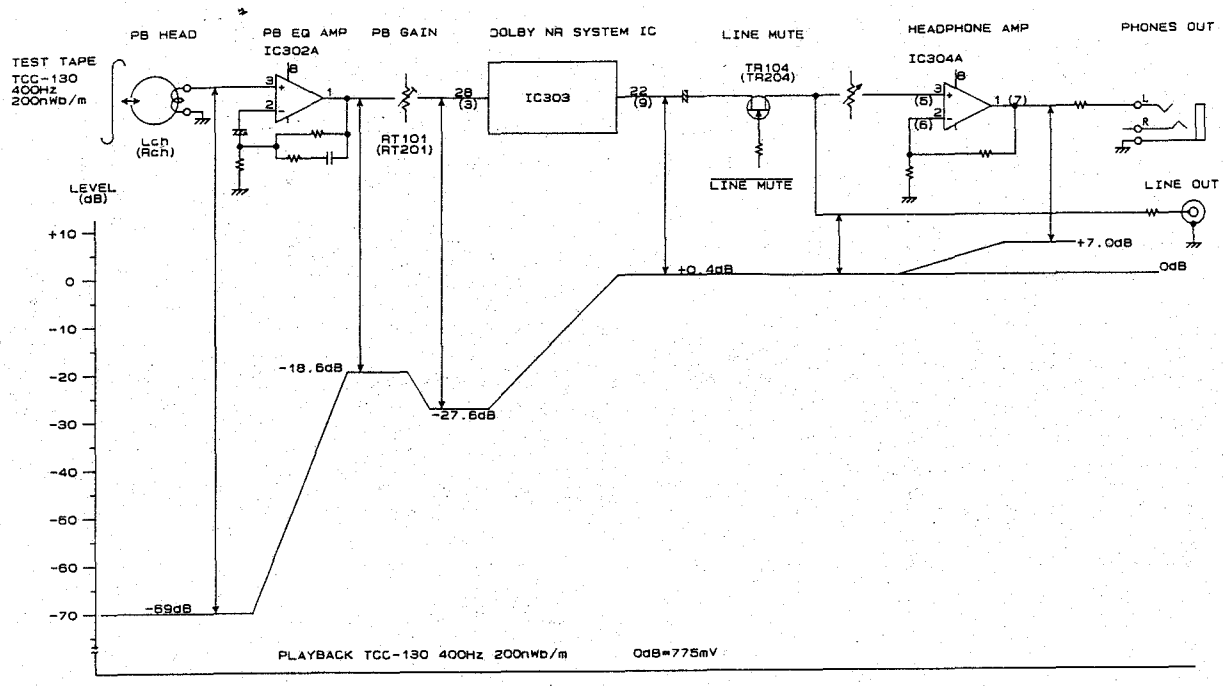
BLOCK DIAGRAM



LEVEL DIAGRAM

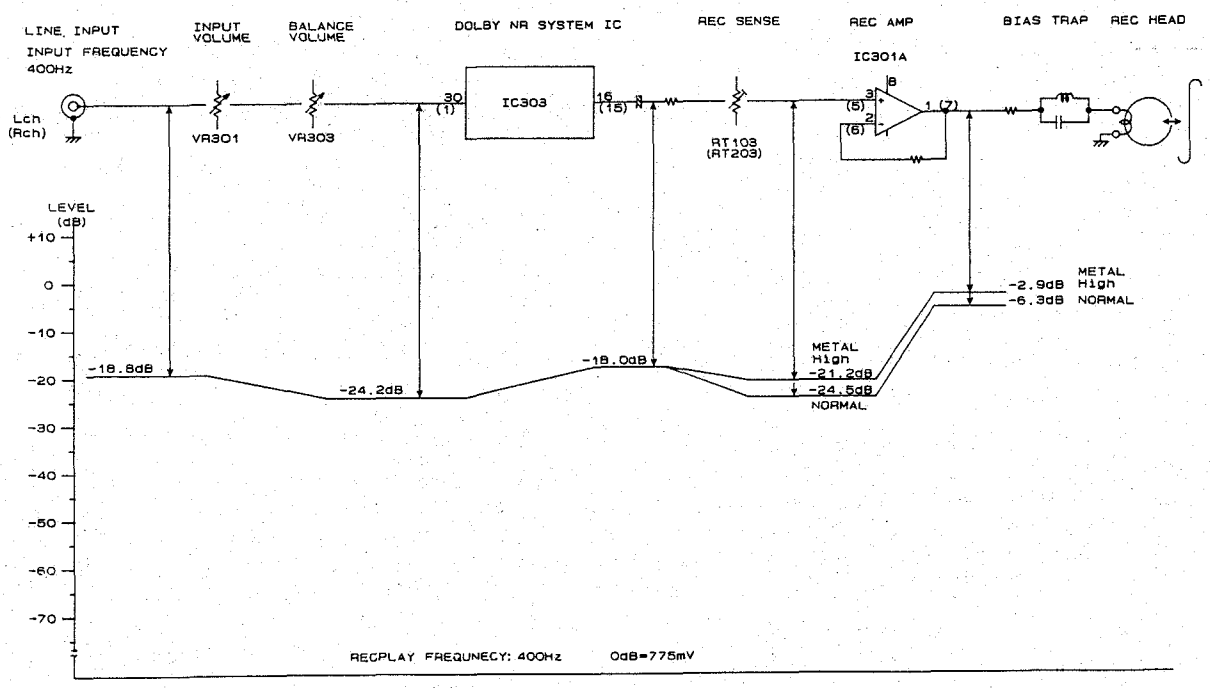
PLAYBACK SYSTEM

TCC-130 DOLBY LEVEL
400 Hz 200 nwb/m



RECPLAY SYSTEM

FREQUENCY
400 Hz



PARTS LIST EXPLODED VIEW

Ref. No.	Part No.	Part Name	Remarks	Q'ty
◉ 1	KU-9336	Audio P.W.B. unit Ass'y		1
1-1	—	Audio P.W.B. unit		
1-2	—	VR P.W.B. unit		
1-3	—	H/P VR P.W.B. unit		
◉ 2	KU-9337	Display P.W.B. unit Ass'y		1
◉ 3	KU-9338	Power P.W.B. unit Ass'y	Europe, U.K., Australia, Asia & Hongkong models	1
3-1	—	Power P.W.B. unit		
3-2	—	SW P.W.B. unit		
◉ 3	KU-9338 U	Power P.W.B. unit Ass'y	U.S.A., Canada & Taiwan models	1
3-1	—	Power P.W.B. unit		
3-2	—	SW P.W.B. unit		
⚠ 5	206 2131 009	AC cord	U.K. model	1
⚠ 5	206 2060 002	AC cord	U.S.A., Canada & Taiwan models	1
⚠ 5	206 2063 009	AC cord	Europe, Asia & Hongkong models	1
⚠ 5	206 2122 005	AC cord	Australia model	1
6	415 0364 087	UL tube (8.3)		1
⚠ 7	445 0056 008	Cord bush		1
8	412 2008 012	Bushing plate		1
◉ 9	105 9263 208	Rear panel		1
◉ 10	411 9142 101	Chassis		1
11	113 1228 035	Foot cap		4
12	461 0410 109	Rubber pad		4
13	144 9237 006	Front panel	Black	1
13	144 9237 019	Front panel	Gold	1
14	103 9222 007	Front esc. (L)	Black	1
14	103 9222 010	Front esc. (L)	Gold	1
15	143 9191 000	Meter window		1
16	129 0163 002	Indicate sheet		1
◉ 17	103 9223 006	Front esc. (R)	Black	1
◉ 17	103 9223 019	Front esc. (R)	Gold	1
18	103 1372 502	Cassette box		1
19	463 9079 000	Cassette spring		2
20	421 9007 007	Mini damper		1
21	463 0659 018	Box spring		1
22	412 9485 007	Eject lever (A)		1
◉ 23	412 9484 008	Mecha.bracket		1
24	463 8238 004	Spring		1
25	113 9334 002	Eject button	Black	1
25	113 9334 015	Eject button	Gold	1
26	113 9335 014	Timer button	Gold	1
26	113 9335 001	Timer button	Black	1
27	113 9331 005	Function button	Black	1
27	113 9331 018	Function button	Gold	1
28	113 9332 017	Push button	Gold	1
28	113 9332 004	Push button	Black	1
29	113 9333 003	Power button	Black	1
29	113 9333 016	Power button	Gold	1
30	112 9142 000	Volume knob	Black	3
30	112 9142 013	Volume knob	Gold	3
31	112 0515 144	Volume knob	Gold	1
31	112 0515 131	Volume knob	Black	1
32	338 9030 002	Cassette mecha.		1
◉ 33	445 8004 007	Wire clamper		2
34	412 3758 002	Dressing plate		1
35	414 0595 015	Earth plate		1
◉ 36	102 9050 108	Top cover	Black	1
◉ 36	102 9050 111	Top cover	Gold	1
37	103 9206 201	Cassette door	Black	1
37	103 9206 214	Cassette door	Gold	1
38	143 9192 009	Window		1

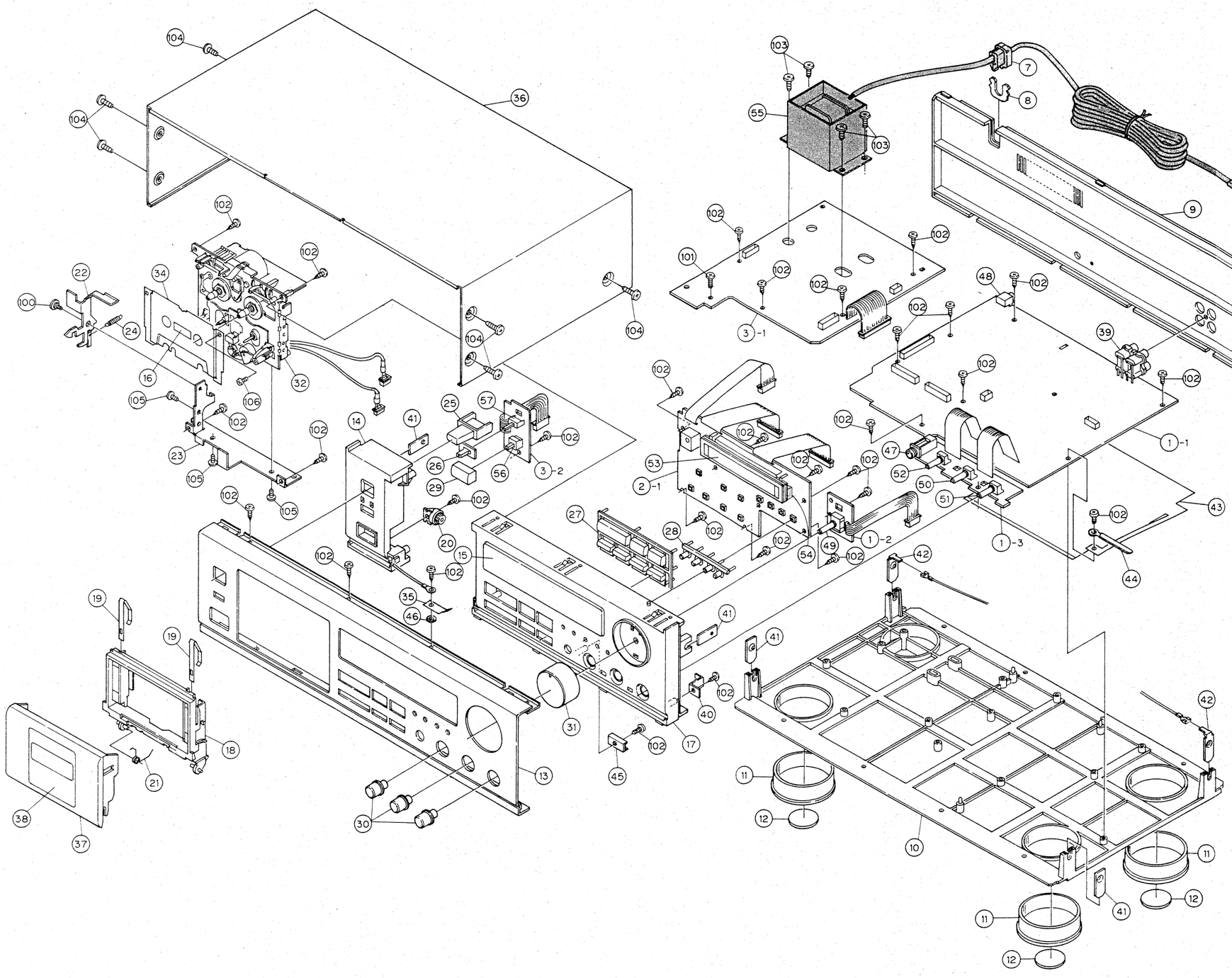
※ Gold: Europe model only

Ref. No.	Part No.	Part Name	Remarks	Q'ty
39	204 8498 009	4P RCA pin jack	JK301	1
40	412 9494 001	PCB bracket		1
41	409 9006 008	Attach plate		1
42	409 9005 009	Attach plate (B)		1
43	414 9187 000	Shilde sheet		1
44	445 0048 016	Cord holder		1
45	M27 -108	T-washer		1
46	475 3201 000	3 TWB		1
47	204 8264 026	H/P jack	JK302	1
48	204 8416 007	Mini jack	JK303	1
49	211 0570 004	Variable resistor	VR301	1
50	211 0706 001	Variable resistor	VR302	1
51	211 0746 003	Variable resistor	VR303(M.N)	1
52	211 0736 000	Variable resistor	VR304	1
53	393 8023 004	*FLD	F501	1
54	129 9025 002	*FLD pad		1
⚠ 55	233 9676 006	Power transformer	Europe, U.K., Australia, Asia & Hongkong models	1
⚠ 55	233 9678 004	Power transformer	U.S.A., Canada & Taiwan models	1
56	212 1039 000	Push switch	SW523	1
57	212 9572 006	Slide switch	SW520	1
SCREW				
100	477 0262 006	Special screw		1
101	473 7002 021	Screw 3×8 CBTS (S)-B		1
102	473 7500 044	Screw 3×8 CBTS (P)-B		30
103	473 7502 013	Screw 4×10 CBTS (P)-Z		4
104	473 7509 016	Screw 4×10 CBTS (P)-B	Black	6
104	473 7503 041	Screw 4×10 CTTS (P)-Ni	Gold	6
105	473 7016 033	Screw 2.6x4 CBTS (S)-Z		4
106	473 7024 009	Screw 2.6x12 CPTS (S)-B		1

Ref. No.	Part No.	Part Name	Remarks	Q'ty
PACKING & ACCESSORIES				
◉	505 8092 010	Envelope		1
◉	505 0038 030	Poly cover		1
	203 2360 004	2P pin cord		2
	203 5013 002	3P mini pulg cord		1
◉	202 0042 004	Plug adapter	Asia model only	1
◉	511 9436 007	Operating insutruction (8)	Europe model	1
◉	511 9437 006	Operating insutruction (3)	U.S.A. & Canada models	1
◉	511 9439 004	Operating insutruction (E)	U.K., Australia, Asia & Hongkong models	1
◉	511 9438 005	Operating insutruction (CH)	Hongkong & Taiwan models	1
◉	503 9297 009	Cushion		2
◉	501 9274 042	Carton case		1
◉	501 9274 055	Carton case	U.K., Australia models only	1
◉	501 9274 068	Carton case	Asia model only	1
◉	502 9130 008	Pad Ass'y	U.K., Australia models only	1

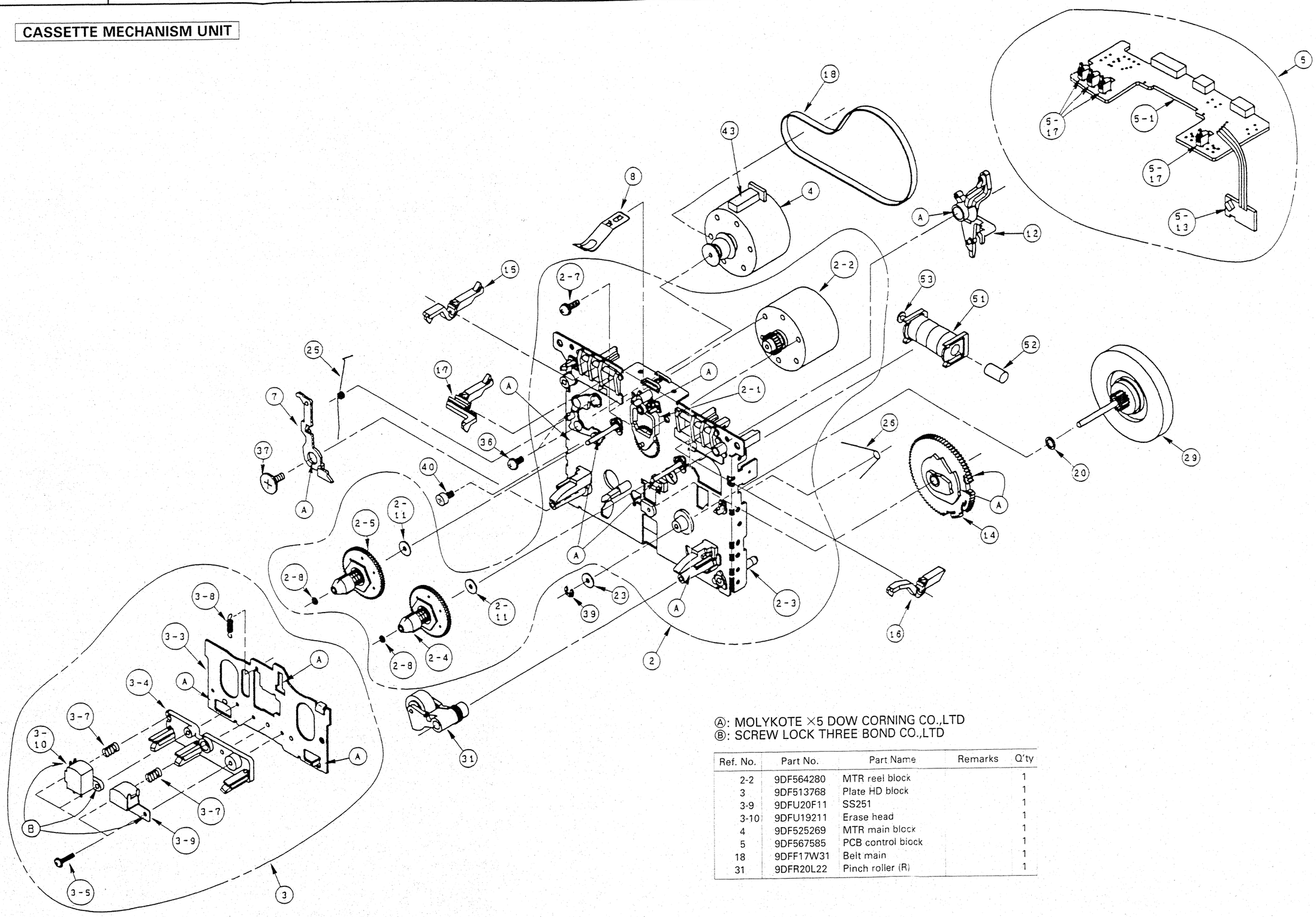
- Part indicated with the mark " ◉ " are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "I" (i) to avoid mis-supplying.

EXPLODED VIEW CHASSIS AND CABINET



WARNING:
Parts marked with this symbol ⚠ ▒ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

CASSETTE MECHANISM UNIT

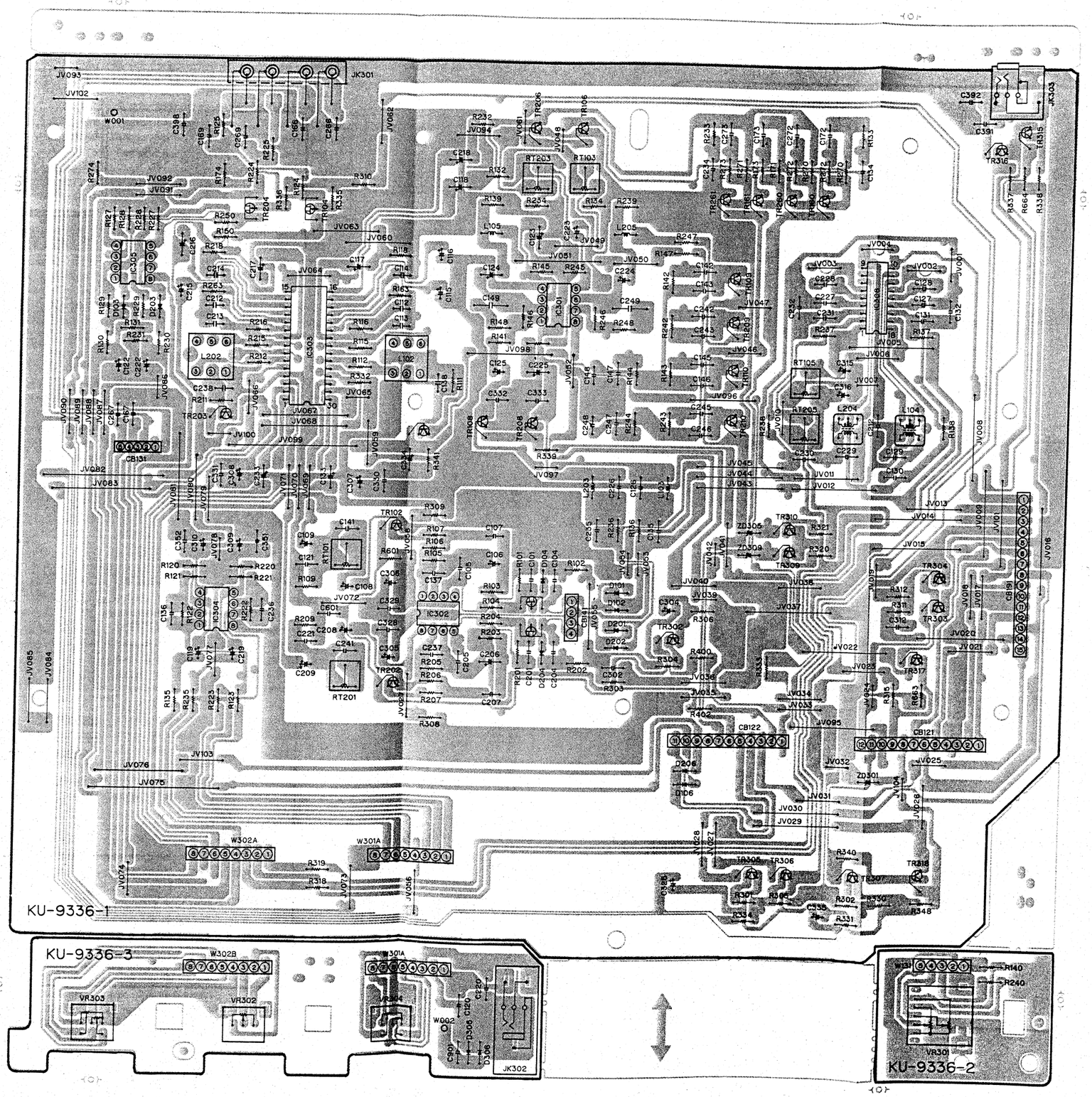


Ⓐ: MOLYKOTE ×5 DOW CORNING CO.,LTD
Ⓑ: SCREW LOCK THREE BOND CO.,LTD

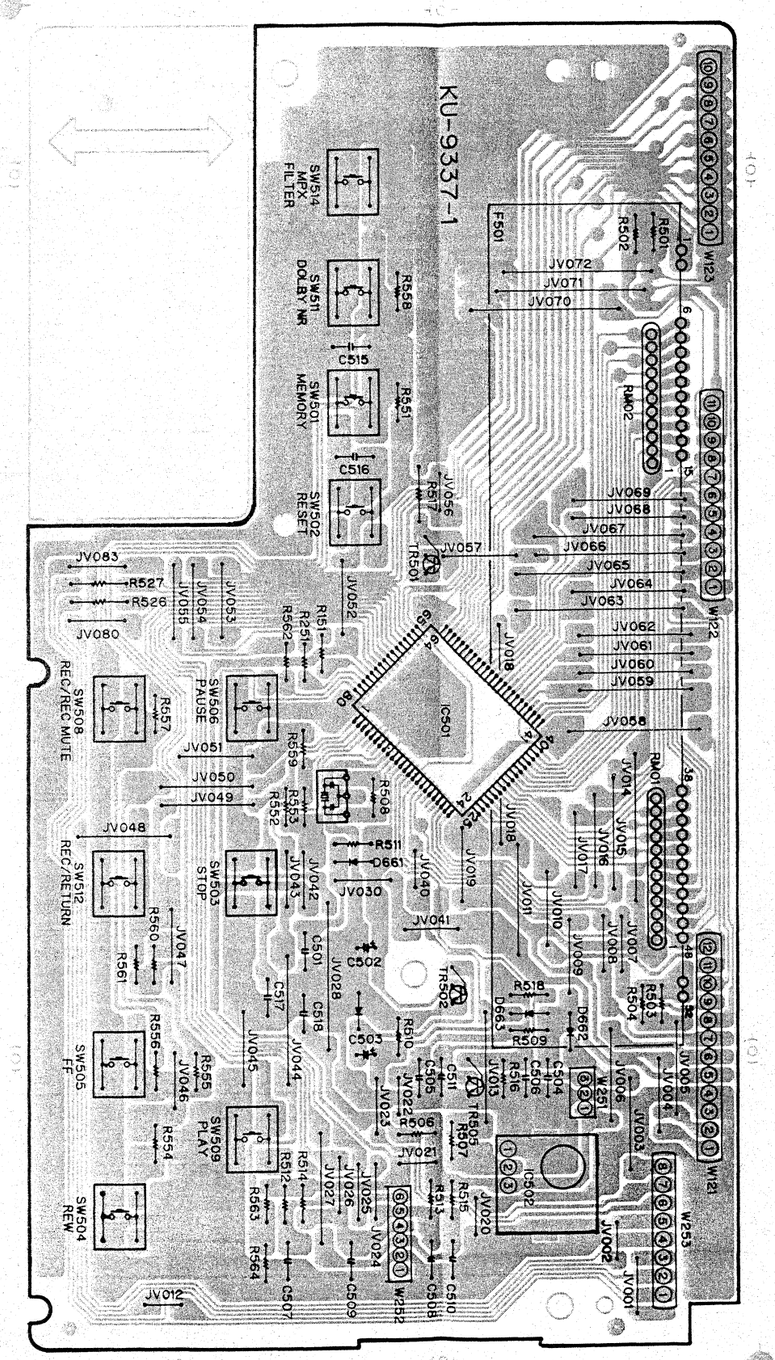
Ref. No.	Part No.	Part Name	Remarks	Q'ty
2-2	9DF564280	MTR reel block		1
3	9DF513768	Plate HD block		1
3-9	9DFU20F11	SS251		1
3-10	9DFU19211	Erase head		1
4	9DF525269	MTR main block		1
5	9DF567585	PCB control block		1
18	9DFF17W31	Belt main		1
31	9DFR20L22	Pinch roller (R)		1

PRINTED WIRING BOARD PATTERNS

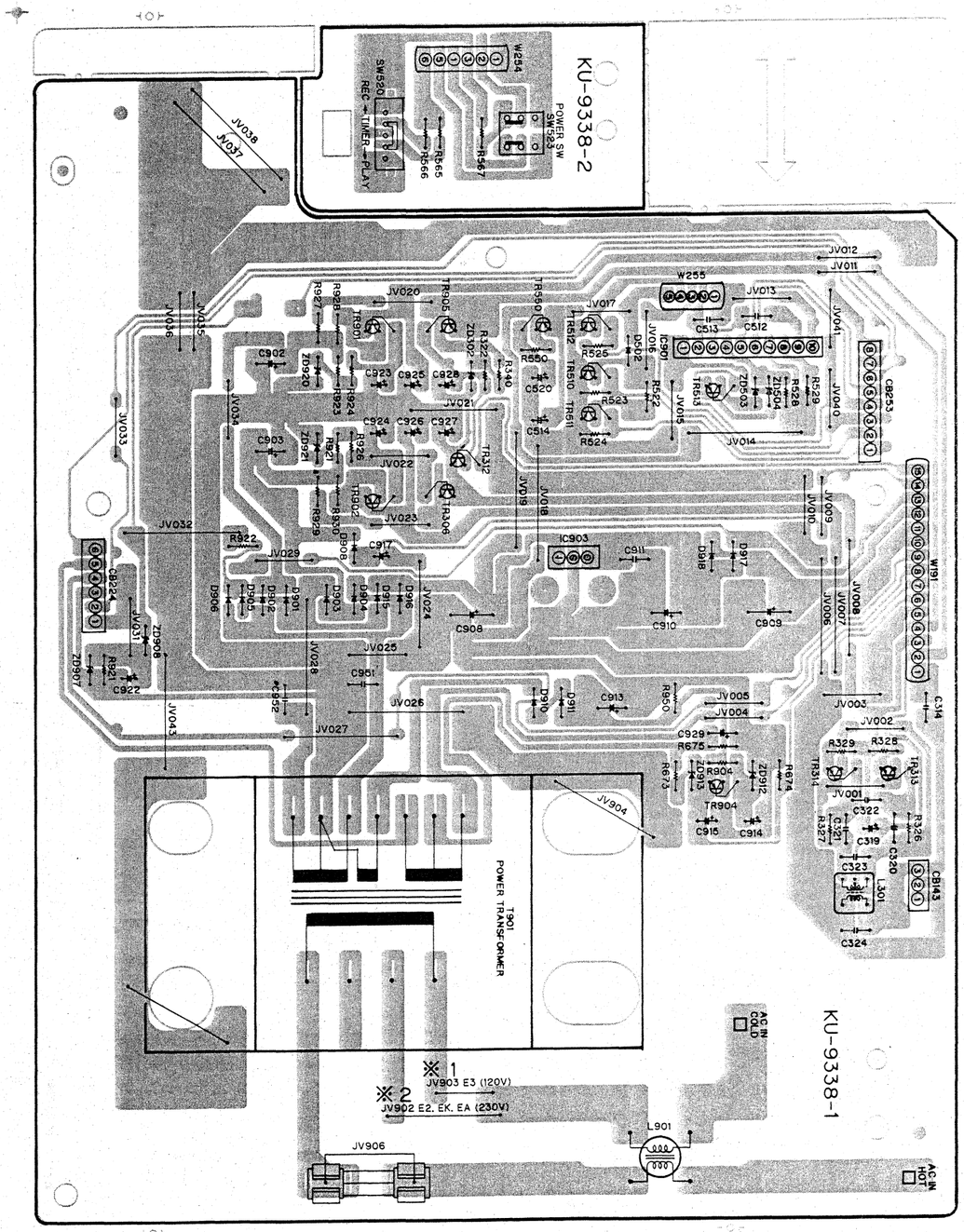
KU-9336 AUDIO P.W.B. UNIT ASS'Y



KU-9337 DISPLAY P.W.B. UNIT ASS'Y



KU-9338 POWER P.W.B. UNIT ASS'Y



※1 U.S.A. and Canada models
※2 Europe, U.K. and Australia models

NOTE FOR PARTS LIST

- Part indicated with the mark " ◉ " are not always in stock and possibly to take a long period of time for supplying, or in some case supplying of part may be refused.
- When ordering of part, clearly indicate "1" and "I" (i) to avoid mis-supplying.
- Ordering part without stating its part number can not be supplied.
- Part indicated with the mark "★" is not illustrated in the exploded view.
- Not including Carbon Film ±5%, 1/4W Type in the P.W.Board parts list. (Refer to the Schematic Diagram for those parts.)

WARNING:
Parts marked with this symbol ⚠ ▒▒▒ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

• Resistors

Ex.: RN 14K 2E 182 G FR
Type / Shape and performance / Power / Resistance / Allowable error / Others

RD	Carbon	2B	1/8W	F	±1%	P	Pulse-resistant type
RC	Composition	2E	1/4W	G	±2%	NL	Low noise type
RS	Metal oxide film	2H	1/2W	J	±5%	NB	Non-burning type
RW	Winding	3A	1W	K	±10%	FR	Fuse-resistor
RN	Metal film	3D	2W	M	±20%	F	Lead wire forming
RK	Metal mixture	3F	3W				
		3H	5W				

*** Resistance**

1 8 2 — 1800 ohm = 1.8 kohm
Indicates number of zeros after effective number.
2-digit effective number
• Units: ohm

1 R 2 — 1.2 ohm
1-digit effective number.
2-digit effective number, decimal point indicated by R.
• Units: ohm

*** Capacity (electrolyte only)**

2 2 2 — 2200μF
Indicates number of zeros after effective number.
2-digit effective number
• Units: μF.

2 R 2 — 2.2μF
1-digit effective number
2-digit effective number, decimal point indicated by R.
• Units: μF.

• Capacitors

Ex.: CE 04W 1H 2R2 M BP
Type / Shape and performance / Dielectric strength / Capacity / Allowable error / Others

CE	Aluminum foil electrolytic	0J	6.3V	F	±1%	HS	High stability type
CA	Aluminum solid electrolytic	1A	10V	G	±2%	BP	Non-polar type
CS	Tantalm electrolitic	1C	16V	J	±5%	HR	Ripple-resistant type
CQ	Film	1E	25V	K	±10%	DL	For charge and discharge
CK	Ceramic	1V	35V	M	±20%	HF	For assuring high frequency
CC	Ceramic	1H	50V	Z	+80% −20%	U	UL part
CP	Oil	2A	100V	P	+100% −0%	C	CSA part
CM	Mica	2B	125V	C	±0.25pF	W	UL-CSA type
CF	Metalized	2C	160V	D	±0.5pF	F	Lead wire forming
CH	Metalized	2D	200V	=	Others		
		2E	250V				
		2H	500V				
		2J	630V				

*** Capacity (except electrolyte)**

2 2 2 — 2200μμF = 0.0022μF
(More than 2) — Indicates number of zeros after effective number.
2-digit effective number.
• Units: μF.

2 2 1 — 220PF
(0 or 1) — Indicates number of zeros after effective number.
2-digit effective number.
• Units: PF.
• When the dielectric strength is indicated in AC, "AC" is included after the dielectric strength value.

PRINTED WIRING BOARD PARTS LIST

KU-9336 AUDIO P.W.B. UNIT ASS'Y

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC301	263 0565 007	IC BA15218	
IC302	262 0864 006	IC μPC4570C	
IC303	263 0720 004	IC HA12170NT	
IC304, 305	263 0565 007	IC BA15218	
IC308	263 0354 001	IC μPC1297CA	
TR101	275 0042 002	Transistor 2SK373 (Y)	
TR102	269 0080 904	Transistor DTA114TS	
TR103	269 0015 908	Transistor DTC124XS	
TR104	275 0055 002	Transistor 2SK184GR	
TR106	273 0303 004	Transistor 2SC1740S	
TR108	269 0072 909	Transistor 2SC323TS	
TR109, 110	269 0074 907	Transistor DTC114TS	
TR161	269 0074 907	Transistor DTC114TS	
TR201	275 0042 002	Transistor 2SK373 (Y)	
TR202	269 0080 904	Transistor DTA114TS	
TR203	269 0015 908	Transistor DTC124XS	
TR204	275 0055 002	Transistor 2SK184GR	
TR206	273 0303 004	Transistor 2SC1740S	
TR208	269 0072 909	Transistor 2SC323TS	
TR209, 210	269 0074 907	Transistor DTC114TS	
TR261	269 0074 907	Transistor DTC114TS	
TR302	269 0046 906	Transistor DTA114ES	
TR303	269 0015 908	Transistor DTC124XS	
TR304	269 0016 907	Transistor DTA144WS	
TR305 ~307	269 0040 902	Transistor DTC144ES	
TR309, 310	269 0015 908	Transistor DTC124XS	
TR315, 316	269 0020 906	Transistor DTC114ES	
TR317	269 0080 904	Transistor DTA114TS	
TR318	269 0046 906	Transistor DTA114ES	
D101 ~104	276 0432 000	Diode 1SS270A	
D106	276 0432 000	Diode 1SS270A	
D201 ~204	276 0432 000	Diode 1SS270A	
D206	276 0432 000	Diode 1SS270A	
D305, 306	276 0432 000	Diode 1SS270A	
ZD301	276 0461 000	Zener diode HZS6A-1	
ZD305	276 0467 004	Zener diode HZS9A-1	
ZD309	276 0467 004	Zener diode HZS9A-1	
RESISTOR GROUP			
R101	241 2338 083	Carbon 150k ohm 1/6W	RD14B==154J
R102		Carbon 2.2M ohm 1/6W	RD14B==225J
R103	241 2331 064	Carbon 150 ohm 1/6W	RD14B==151J
R104	241 2331 022	Carbon 100 ohm 1/6W	RD14B==101J
R105	241 2339 037	Carbon 240k ohm 1/6W	RD14B==244J
R106	241 2336 069	Carbon 18k ohm 1/6W	RD14B==183J
R107	241 2663 098	Carbon 24k ohm 1/6W	RD14B==243J
R109	241 2336 085	Carbon 22k ohm 1/6W	RD14B==223J
R111	241 2340 084	Carbon 1M ohm 1/6W	RD14B==105J
R112	241 2334 087	Carbon 3.3k ohm 1/6W	RD14B==332J
R115	241 2335 060	Carbon 6.8k ohm 1/6W	RD14B==682J
R116	241 2336 085	Carbon 22k ohm 1/6W	RD14B==223J
R118	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R120	241 2337 088	Carbon 47k ohm 1/6W	RD14B==473J
R121	241 2337 026	Carbon 33k ohm 1/6W	RD14B==333J

Ref. No.	Part No.	Part Name	Remarks
R122	241 2337 026	Carbon 33k ohm 1/6W	RD14B==333J
R123	241 2331 022	Carbon 100 ohm 1/6W	RD14B==101J
R124	241 2332 050	Carbon 360k ohm 1/6W	RD14B==361J
R125	241 2331 022	Carbon 100 ohm 1/6W	RD14B==101J
R127	241 2338 009	Carbon 68k ohm 1/6W	RD14B==683J
R128, 129	241 2337 000	Carbon 27k ohm 1/6W	RD14B==273J
R130	241 2331 022	Carbon 100 ohm 1/6W	RD14B==101J
R131	241 2340 084	Carbon 1M ohm 1/6W	RD14B==105J
R132	241 2335 043	Carbon 15k ohm 1/6W	RD14B==153J
R133	241 2337 055	Carbon 43k ohm 1/6W	RD14B==433J
R134	241 2334 045	Carbon 2.2k ohm 1/6W	RD14B==222J
R136	241 2335 057	Carbon 6.2k ohm 1/6W	RD14B==622J
R137	241 2335 043	Carbon 15k ohm 1/6W	RD14B==153J
R138	241 2338 083	Carbon 150k ohm 1/6W	RD14B==154J
R139	241 2334 090	Carbon 3.6k ohm 1/6W	RD14B==362J
R140	241 2337 000	Carbon 27k ohm 1/6W	RD14B==273J
R141	241 2331 093	Carbon 200 ohm 1/6W	RD14B==201J
R145	241 2336 085	Carbon 22k ohm 1/6W	RD14B==223J
R146	241 2339 008	Carbon 180k ohm 1/6W	RD14B==184J
R147	241 2332 005	Carbon 220 ohm 1/6W	RD14B==221J
R148	241 2337 013	Carbon 30k ohm 1/6W	RD14B==303J
R150	241 2663 098	Carbon 24k ohm 1/6W	RD14B==243J
R163	241 2333 004	Carbon 560 ohm 1/6W	RD14B==561J
R171	241 2337 000	Carbon 27k ohm 1/6W	RD14B==273J
R173	241 2335 086	Carbon 8.2k ohm 1/6W	RD14B==822J
R174	241 2335 015	Carbon 4.3k ohm 1/6W	RD14B==432J
R201	241 2338 083	Carbon 150k ohm 1/6W	RD14B==154J
R202		Carbon 2.2M ohm 1/6W	RD14B==225J
R203	241 2331 064	Carbon 150 ohm 1/6W	RD14B==151J
R204	241 2331 022	Carbon 100 ohm 1/6W	RD14B==101J
R205	241 2339 037	Carbon 240k ohm 1/6W	RD14B==244J
R206	241 2336 069	Carbon 18k ohm 1/6W	RD14B==183J
R207	241 2663 098	Carbon 24k ohm 1/6W	RD14B==243J
R209	241 2336 085	Carbon 22k ohm 1/6W	RD14B==223J
R211	241 2340 084	Carbon 1M ohm 1/6W	RD14B==105J
R212	241 2334 087	Carbon 3.3k ohm 1/6W	RD14B==332J
R215	241 2335 060	Carbon 6.8k ohm 1/6W	RD14B==682J
R216	241 2336 085	Carbon 22k ohm 1/6W	RD14B==223J
R218	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R220	241 2337 088	Carbon 47k ohm 1/6W	RD14B==473J
R221	241 2337 026	Carbon 33k ohm 1/6W	RD14B==333J
R222	241 2337 026	Carbon 33k ohm 1/6W	RD14B==333J
R223	241 2331 022	Carbon 100 ohm 1/6W	RD14B==101J
R224	241 2332 050	Carbon 360 ohm 1/6W	RD14B==361J
R225	241 2331 022	Carbon 100 ohm 1/6W	RD14B==101J
R227	241 2338 009	Carbon 68k ohm 1/6W	RD14B==683J
R228, 229	241 2337 000	Carbon 27k ohm 1/6W	RD14B==273J
R230	241 2331 022	Carbon 100 ohm 1/6W	RD14B==101J
R231	241 2340 084	Carbon 1M ohm 1/6W	RD14B==105J
R232	241 2335 043	Carbon 15k ohm 1/6W	RD14B==153J
R233	241 2337 055	Carbon 43k ohm 1/6W	RD14B==433J
R234	241 2334 045	Carbon 2.2k ohm 1/6W	RD14B==222J
R236	241 2335 057	Carbon 6.2k ohm 1/6W	RD14B==622J
R237	241 2335 043	Carbon 15k ohm 1/6W	RD14B==153J
R238	241 2338 083	Carbon 150k ohm 1/6W	RD14B==154J
R239	241 2334 090	Carbon 3.6k ohm 1/6W	RD14B==362J
R240	241 2337 000	Carbon 27k ohm 1/6W	RD14B==273J
R241	241 2331 093	Carbon 200 ohm 1/6W	RD14B==201J
R245	241 2336 085	Carbon 22k ohm 1/6W	RD14B==223J
R246	241 2339 008	Carbon 180k ohm 1/6W	RD14B==184J
R247	241 2332 005	Carbon 220 ohm 1/6W	RD14B==221J
R248	241 2337 013	Carbon 30k ohm 1/6W	RD14B==303J

Ref. No.	Part No.	Part Name	Remarks
R250	241 2663 098	Carbon 24k ohm 1/6W	RD14B==243J
R263	241 2333 004	Carbon 560 ohm 1/6W	RD14B==561J
R271	241 2337 000	Carbon 27k ohm 1/6W	RD14B==273J
R273	241 2335 086	Carbon 8.2k ohm 1/6W	RD14B==822J
R274	241 2335 015	Carbon 4.3k ohm 1/6W	RD14B==432J
R301, 302	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R303	241 2338 041	Carbon 100k ohm 1/6W	RD14B==104J
R304, 305	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R306	241 2333 062	Carbon 1k ohm 1/6W	RD14B==102J
R308, 309	241 2332 047	Carbon 330 ohm 1/6W	RD14B==331J
R310		Carbon 2.2M ohm 1/6W	RD14B==225J
R311	241 2337 088	Carbon 47k ohm 1/6W	RD14B==473J
R312		Carbon 2.2M ohm 1/6W	RD14B==225J
R315	241 2335 043	Carbon 15k ohm 1/6W	RD14B==153J
R318	241 2333 075	Carbon 1.1k ohm 1/6W	RD14B==112J
R319	241 2334 045	Carbon 2.2k ohm 1/6W	RD14B==222J
R320	241 2335 044	Carbon 5.5k ohm 1/6W	RD14B==562J
R321	241 2333 001	Carbon 1.3k ohm 1/6W	RD14B==132J
R330	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R331	241 2336 085	Carbon 22k ohm 1/6W	RD14B==223J
R332	241 2336 069	Carbon 18k ohm 1/6W	RD14B==183J
R333	241 2334 087	Carbon 3.3k ohm 1/6W	RD14B==332J
R334	241 2336 085	Carbon 22k ohm 1/6W	RD14B==223J
R335, 336		Carbon 2.2M ohm 1/6W	RD14B==225J
R337	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R338	241 2336 085	Carbon 22k ohm 1/6W	RD14B==223J
R339	241 2334 045	Carbon 2.2k ohm 1/6W	RD14B==222J
R341	241 2338 041	Carbon 100k ohm 1/6W	RD14B==104J
R348	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R349	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R400	241 2332 089	Carbon 470 ohm 1/6W	RD14B==471J
R601	241 2335 028	Carbon 4.7k ohm 1/6W	RD14B==472J
R602	241 2333 062	Carbon 1k ohm 1/6W	RD14B==102J
R663	241 2335 028	Carbon 4.7k ohm 1/6W	RD14B==472J
R664	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
RT101	211 6047 065	Semi fixed resistor 47k ohm	V06PB473
RT103	211 6047 049	Semi fixed resistor 22k ohm	V06PB223
RT105	211 6047 065	Semi fixed resistor 47k ohm	V06PB473
RT201	211 6047 065	Semi fixed resistor 47k ohm	V06PB473
RT203	211 6047 049	Semi fixed resistor 22k ohm	V06PB223
RT205	211 6047 065	Semi fixed resistor 47k ohm	V06PB473
VR301	211 0570 004	Variable resistor 100k ohm	V14V25FA104R
VR302	211 0706 001	Variable resistor 1k ohm	V09V25FB102K
VR303 (M.N)	211 0746 003	Variable resistor 100k ohm	V09V25FW104
VR304	211 0736 000	Variable resistor 10k ohm	V09V25FA103
CAPACITORS GROUP			
C101	253 3645 008	Ceramic 560pF/50V	CC45SL1H561J
C104	253 9003 000	Ceramic 1000pF/25V	CK45=1E102M
C105	253 3627 000	Ceramic 100pF/50V	CC45SL1H101J
C106	254 4250 042	Electrolytic 330μ/6.3V	CE04W0J331M
C107	255 1256 000	Film 7500pF/50V	CQ92M1H752J
C108	254 4140 000	Electrolytic 4.7μ/35V	CE04W1V4R7M
C109	254 4243 017	Electrolytic 1μ/50V	CE04W1H010M
C112 ~114	255 1134 009	Film 2200pF/50V	CQ92M1H222J
C115, 116	254 4260 003	Electrolytic 0.1μ/50V	CE04W1H0R1M
C117	254 4140 000	Electrolytic 4.7μ/35V	CE04W1V4R7M
C118	254 4132 005	Electrolytic 10μ/16V	CE04W1C100M
C119	254 4140 000	Electrolytic 4.7μ/35V	CE04W1V4R7M
C120	253 9030 060	Ceramic 0.01μF/25V	CK45=1E103K
C122	254 4145 005	Electrolytic 0.47μ/50V	CE04W1HR47M

Ref. No.	Part No.	Part Name	Remarks
C123	254 4140 000	Electrolytic 4.7μ/35V	CE04W1V4R7M
C124	254 4135 002	Electrolytic 47μ/16V	CE04W1C470M
C125	254 4140 000	Electrolytic 4.7μ/35V	CE04W1V4R7M
C126	253 3631 009	Ceramic 150pF/50V	CC45SL1H151J
C127	253 0300 086	Ceramic 0.022μF/25V	CK45=1E223K
C128	253 9030 099	Ceramic 0.033μF/25V	CK45=1E333K
⚠C129	253 3641 002	Ceramic 390pF/500V	CC45SL2H391J
C130	253 3627 000	Ceramic 100pF/50V	CC45SL1H101J
C131	253 9030 060	Ceramic 0.01μF/25V	CK45=1E103K
C132	253 9031 043	Ceramic 1200pF/25V	CK45=1E122K
C133	254 4243 017	Electrolytic 1μ/50V	CE04W1H010M
C134	253 9030 002	Ceramic 1000pF/25V	CK45=1E102K
C135	253 3645 008	Ceramic 560pF/50V	CK45SL1H561J
C136	253 3627 000	Ceramic 100pF/50V	CC45SL1H101J
C138	255 1135 040	Film 2700pF/50V	CQ92M1H272J
C141	253 3633 007	Ceramic 180pF/50V	CC45SL1H181J
C143	253 9030 028	Ceramic 2200pF/25V	CK45=1E222K
C146	253 9031 072	Ceramic 3900pF/25V	CK45=1E392K
C148	255 1256 000	Film 7500pF/50V	CQ92M1H752J
C149	255 1122 037	Film 0.082μF/50V	CQ93M1H823J
C166	253 3641 002	Ceramic 390pF/50V	CC45SL1H391J
C169	253 3641 002	Ceramic 390pF/50V	CC45SL1H391J
C173	253 9030 057	Ceramic 6800pF/25V	CK45=1E682K
C201	253 3645 008	Ceramic 560pF/50V	CC45SL1H561J
C204	253 9003 000	Ceramic 1000pF/25V	CK45=1E102M
C205	253 3627 000	Ceramic 100pF/50V	CC45SL1H101J
C206	254 4250 042	Electrolytic 330μ/6.3V	CE04W0J331M
C207	255 1256 000	Film 7500pF/50V	CQ92M1H752J
C208	254 4140 000	Electrolytic 4.7μ/35V	CE04W1V4R7M
C209	254 4243 017	Electrolytic 1μ/50V	CE04W1H010M
C212 ~214	255 1134 009	Film 2200pF/50V	CQ92M1H222J
C215, 216	254 4260 003	Electrolytic 0.1μ/50V	CE04W1H0R1M
C217	254 4140 000	Electrolytic 4.7μ/35V	CE04W1V4R7M
C218	254 4132 005	Electrolytic 10μ/16V	CE04W1C100M
C219	254 4140 000	Electrolytic 4.7μ/35V	CE04W1V4R7M
C220	253 9030 060	Ceramic 0.01μF/25V	CK45=1E103K
C222	254 4145 005	Electrolytic 0.47μ/50V	CE04W1HR47M
C223	254 4140 000	Electrolytic 4.7μ/35V	CE04W1V4R7M
C224	254 4135 002	Electrolytic 47μ/16V	CE04W1C470M
C225	254 4140 000	Electrolytic 4.7μ/35V	CE04W1V4R7M
C226	253 3631 009	Ceramic 150pF/50V	CC45SL1H151J
C227	253 0300 086	Ceramic 0.022μF/25V	CK45=1E223K
C228	253 9030 099	Ceramic 0.033μF/25V	CK45=1E333K
⚠C229	253 3641 002	Ceramic 390pF/500V	CC45SL2H391J
C230	253 3627 000	Ceramic 100pF/50V	CC45SL1H101J
C231	253 9030 060	Ceramic 0.01μF/25V	CK45=1E103K
C232	253 9031 043	Ceramic 1200pF/25V	CK45=1E122K
C233	254 4243 017	Electrolytic 1μ/50V	CE04W1H010M
C234	253 9030 002	Ceramic 1000pF/25V	CK45=1E102K
C235	253 3645 008	Ceramic 560pF/50V	CC45SL1H561J
C236	253 3627 000	Ceramic 100pF/50V	CC45SL1H101J
C238	255 1135 040	Film 2700pF/50V	CQ92M1H272J
C241	253 3633 007	Ceramic 180pF/50V	CC45SL1H181J
C243	253 9030 028	Ceramic 2200pF/25V	CK45=1E222K
C246	253 9031 072	Ceramic 3900pF/25V	CK45=1E392K
C248	255 1256 000	Film 7500pF/50V	CQ92M1H752J
C249	255 1122 037	Film 0.082pF/50V	CQ93M1H823J
C266	253 3641 002	Ceramic 390pF/50V	CC45SL1H391J
C269	253 3641 002	Ceramic 390pF/50V	CC45SL1H391J
C273	253 9030 057	Ceramic 6800pF/25V	CK45=1E682K
C302	253 9003 000	Ceramic 1000pF/25V	CK45=1E102M
C304	254 4136 001	Electrolytic 100μ/16V	CE04W1C101M
C305, 306	254 4135 002	Electrolytic 47μ/16V	CE04W1C470M
C307, 308	254 4132 005	Electrolytic 10μ/16V	CE04W1C100M

Ref. No.	Part No.	Part Name	Remarks
C309, 310	254 4135 002	Electrolytic 47μ/16V	CE04W1C470M
C312	253 9030 060	Ceramic 0.01μF/25V	CK45=1E103K
C313	253 9031 001	Ceramic 0.0347μF/25V	CK45=1E473K
C315, 316	254 4132 005	Electrolytic 10μ/16V	CE04W1C100M
C325	254 4239 021	Electrolytic 22μ/25V	CE04W1E220M
C328 ~331	253 9030 060	Ceramic 0.01μF/25V	CK45=1E103K
C334	254 4132 005	Electrolytic 10μ/16V	CE04W1H100M
C390 ~392	253 9036 006	Ceramic 0.1μF/25V	CK45=1E104Z
C601	253 9036 006	Ceramic 0.1μF/25V	CK45=1E104Z
C901	253 9036 006	Ceramic 0.1μF/25V	CK45=1E104Z
OTHER PARTS			
L102	232 0109 003	MPX filter	253AGGS-1157
L103	235 0020 945	Inductor 15mH	181LY153J
L104	239 0010 009	HX ptep up coil	
L105	235 0020 916	Inductor 8.2mH	181LY822J
L202	232 0109 003	MPX filter	253AGGS-1157
L203	235 0020 945	Inductor 15mH	181LY153J
L204	239 0010 009	HX ptep up coil	
L205	235 0020 916	Inductor 8.2mH	181LY822J
JK301	204 8498 009	4P RCA pin jack	
JK302	204 8264 026	H/P jack	
JK303	204 8416 007	Mini jack	
CB121	205 0981 067	12P connector base	
CB122	205 0981 054	11P connector base	
CB131	205 0981 025	5P connector base	
CB141	205 0981 012	4P connector base	
CB191	205 0981 067	15P connector base	
W131	203 8458 004	5P connector cord	
W301A-W301B	002 0053 008	8C ribon wire	
W302A-W302B	002 0053 008	8C ribon wire	
W001	203 0639 012	1P wire	
W002	203 0638 013	1P contact Ass'y	

KU-9337 DISPLAY P.W.B. UNIT ASS'Y

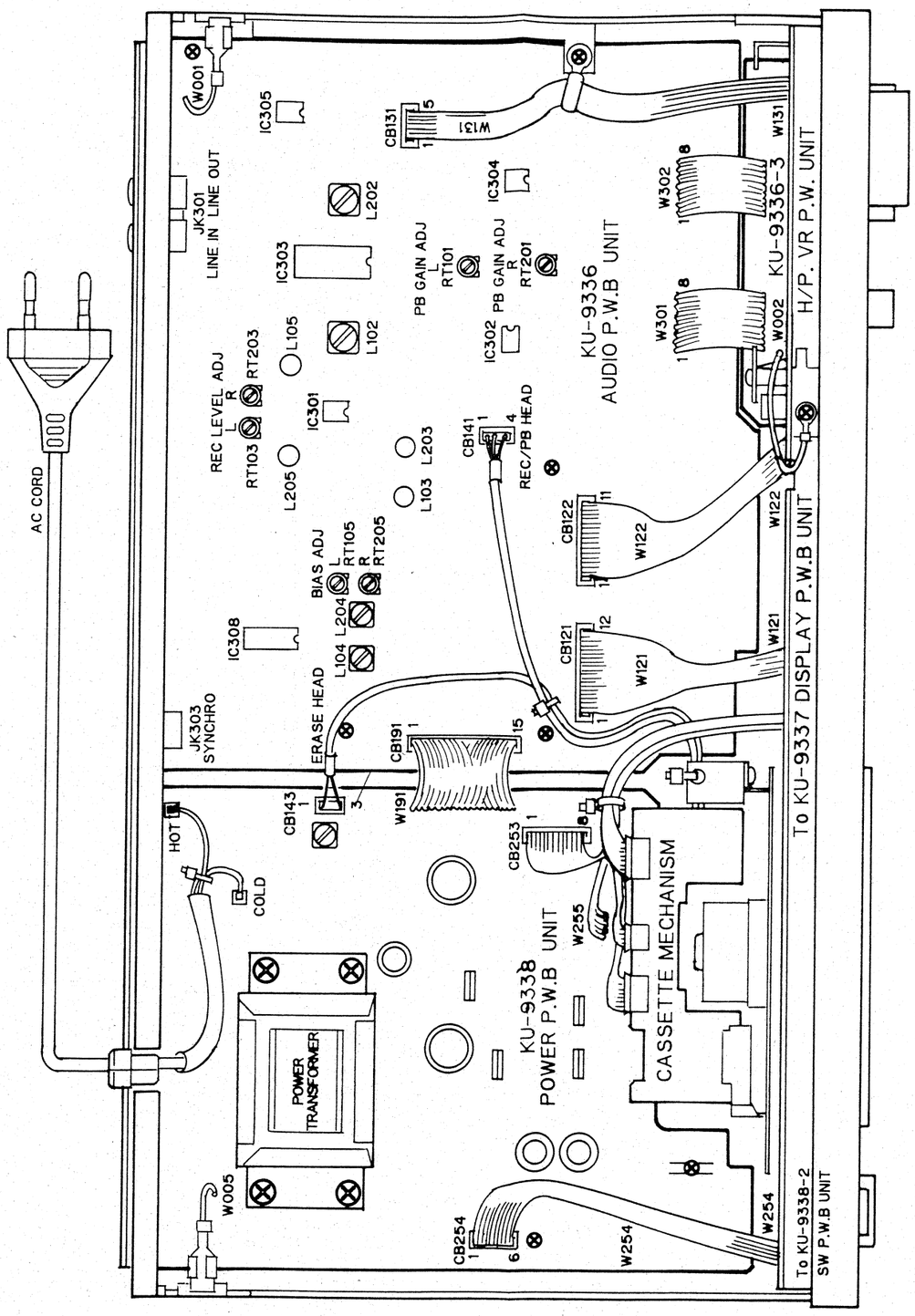
Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC501	262 2240 000	IC HD6433724D49F	μcon
IC502	499 0150 008	IC SBX1610-52	Remote sensor
TR501	269 0046 906	Transistor DTA114ES	
TR502	269 0040 902	Transistor DTC144ES	
TR505	269 0099 908	Transistor DTC143TS	
D526	276 0432 000	Diode 1SS270A/1N4125	
D661	276 0432 000	Diode 1SS270A/1N4125	
D663	276 0432 000	Diode 1SS270A/1N4125	
RESISTOR GROUP			
R151	241 2334 045	Carbon 2.2k ohm 1/6W	RD14B==222J
R251	241 2334 045	Carbon 2.2k ohm 1/6W	RD14B==222J
R501		Carbon 4.3 ohm 1/6W	RD14B==4R3J
R503		Carbon 4 · 3 ohm 1/6W	RD14B==4R3J
R506	241 2333 062	Carbon 1k ohm 1/6W	RD14B==102J
R507	241 2331 093	Carbon 200 ohm 1/6W	RD14B==201J
R508, 509	241 2340 084	Carbon 1M ohm 1/6W	RD14B==105J
R510	241 2336 072	Carbon 20k ohm 1/6W	RD14B==203J
R511	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R512 ~515	241 2335 028	Carbon 4.7k ohm 1/6W	RD14B==472J
R516	241 2336 085	Carbon 22k ohm 1/6W	RD14B==223J
R517	241 2335 028	Carbon 4.7k ohm 1/6W	RD14B==472J
R518	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R526, 527	241 2333 062	Carbon 1k ohm 1/6W	RD14B==102J
R551 ~553	241 2333 062	Carbon 1k ohm 1/6W	RD14B==102J
R554, 555	241 2331 064	Carbon 150 ohm 1/6W	RD14B==151J
R556	241 2331 080	Carbon 180 ohm 1/6W	RD14B==181J
R557	241 2332 021	Carbon 270 ohm 1/6W	RD14B==271J
R558	241 2332 063	Carbon 390 ohm 1/6W	RD14B==391J
R559	241 2331 064	Carbon 150 ohm 1/6W	RD14B==151J
R560	241 2331 080	Carbon 180 ohm 1/6W	RD14B==181J
R561	241 2332 021	Carbon 270 ohm 1/6W	RD14B==271J
R562	241 2333 062	Carbon 1k ohm 1/6W	RD14B==102J
R563	241 2335 031	Carbon 5.1k ohm 1/6W	RD14B==512J
R564	241 2333 033	Carbon 680 ohm 1/6W	RD14B==681J
CAPACITORS GROUP			
C501	253 9036 006	Ceramic 0.1μ/25V	CK45=1E104Z
C502	254 4260 058	Electrolytic 2.2μ/50V	CE04W1H2R2M
C503	254 4260 061	Electrolytic 3.3 μ/50V	CE04W1H3R3M
C504, 505	253 9036 006	Ceramic 0.1μ/25V	CK45=1E104Z
C506	253 9030 060	Ceramic 0.01μ/25V	CK45=1E103K
C511	253 9030 060	Ceramic 0.01μ/25V	CK45=1E103K
OTHER PARTS			
XT501	399 0107 007	Resonator 4.19MHz	CST4.19MGW
F501	393 8023 004	*FLD	BJ415GK
	129 9025 002	*FLD pad	10×10×t6
SW501 ~506	212 5608 000	Tact switch	
SW508, 509	212 5608 000	Tact switch	
SW511, 512	212 5608 000	Tact switch	
SW514	212 5608 000	Tact switch	
W121	204 6567 000	12P connector cord	
W122	204 6566 001	11P connector cord	
W251	203 5145 006	3P connector cord	
W252	204 0510 008	6P connector cord	
W253	204 2775 003	8P connector cord	

KU-9338 POWER P.W.B. UNIT ASS'Y

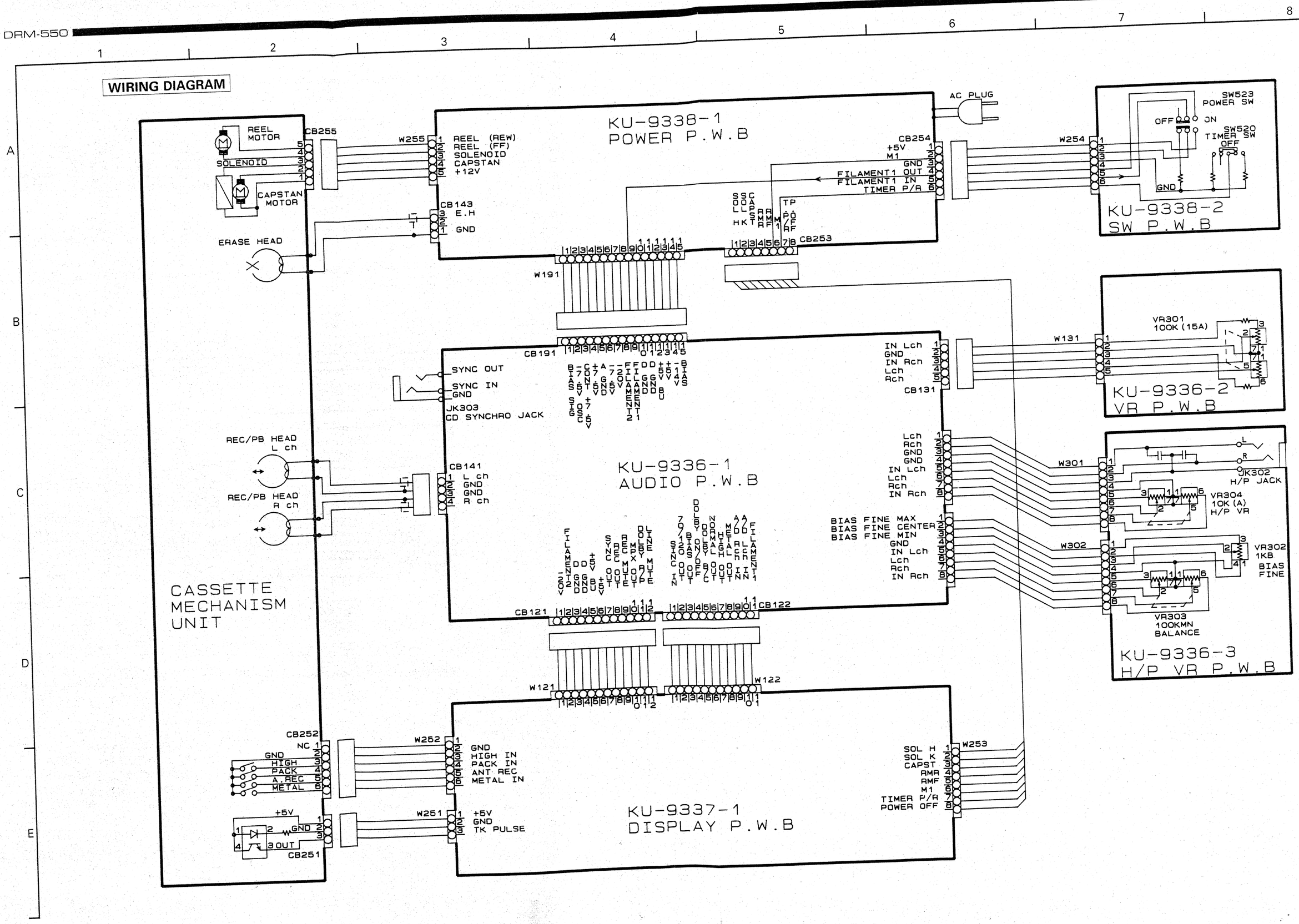
Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC601	262 0447 009	IC BA6109	
IC903	263 0793 002	IC NJM7806FA	
TR312	269 0020 906	Transistor DTC114ES	
TR313, 314	273 0303 004	Transistor 2SC1740S	
TR510 ~512	274 0146 905	Transistor 2SD1858Q/R	
TR513	269 0015 908	Transistor DTC124XS	
TR550	274 0120 002	Transistor 2SD1762E/F	
TR901	274 0126 002	Transistor 2SD1762E/F	
TR902	272 0083 004	Transistor 2SB1185Q/R	
TR904	272 0099 904	Transistor 2SB1237Q/R	
TR905	274 0120 002	Transistor 2SD1762E/F	
TR906	272 0083 004	Transistor 2SB1185Q/R	
D501	276 0553 905	Diode 1SR35-200A	
D502	276 0432 000	Diode 1SS270A	
D901 ~904	276 0553 905	Diode 1SR35-200A	
D905, 906	276 0432 000	Diode 1SS270A	
D908	276 0432 000	Diode 1SS270A	
D910, 911	276 0553 905	Diode 1SR35-200A	
D915 ~918	276 0553 905	Diode 1SR35-200A	
ZD302	276 0477 007	Zener diode HZS16-1	
ZD503	276 0457 001	Zener diode HZS4C-1	
ZD504	276 0465 006	Zener diode HZS7B-1	
ZD907	276 0460 001	Zener diode HZS5C-1	
ZD908	276 0457 001	Zener diode HZS4C-1	
ZD912	276 0479 005	Zener diode HZS20-1	
ZD913	276 0460 001	Zener diode HZS5C-1	
ZD920, 921	276 0467 004	Zener diode HZS9A-1	
RESISTOR GROUP			
R322	241 2333 062	Carbon 1k ohm 1/6W	RD14B==102J
R326, 327	241 2338 067	Carbon 120k ohm 1/6W	RD14B==124J
R328, 329	241 2328 006	Carbon 4.7 ohm 1/6W	RD14B==4R7J
R340	241 2334 045	Carbon 2.2k ohm 1/6W	RD14B==222J
⚠R522		Metal oxide 56 ohm 2W	
R523, 524	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R525	241 2333 062	Carbon 1k ohm 1/6W	RD14B==102J
R528	241 2334 003	Carbon 1.5k ohm 1/6W	RD14B==152J
⚠R529	241 2315 912	Carbon 10 ohm 1/4W	RD14B2E100GFRST
R550	241 2331 063	Carbon 390 ohm 1/6W	RD14B==391J
R565	241 2331 064	Carbon 150 ohm 1/6W	RD14B==151J
R566	241 2332 047	Carbon 330 ohm 1/6W	RD14B==152J
R567	241 2335 031	Carbon 5.1k ohm 1/6W	RD14B2E512J
R673	241 2331 022	Carbon 100 ohm 1/6W	RD14B==101J
R674	241 2337 013	Carbon 30k ohm 1/6W	RD14B==303J
R675	241 2336 001	Carbon 10k ohm 1/6W	RD14B==103J
R904	241 2334 058	Carbon 2.4k ohm 1/6W	RD14B==242J
R921	241 2336 072	Carbon 20k ohm 1/6W	RD14B==203J
R922	241 2334 074	Carbon 3k ohm 1/6W	RD14B==302J
R923	241 2333 062	Carbon 1k ohm 1/6W	RD14B==102J
R924	241 2332 005	Carbon 220 ohm 1/6W	RD14B==221J
R925	241 2333 062	Carbon 1k ohm 1/6W	RD14B==102J
R926	241 2332 005	Carbon 220 ohm 1/6W	RD14B==221J
⚠R927 ~930	241 2313 985	Carbon 4.7 ohm 1/4W	RD14B2E4R7JFRST
R950	241 2338 041	Carbon 100k ohm 1/6W	RD14B==154J

Ref. No.	Part No.	Part Name	Remarks
CAPACITORS GROUP			
C314	253 4536 006	Ceramic 10pF/50V	CC45SL1H100J
C319	254 4256 949	Electrolytic 100μ/25V	CE04W1E101M
C320, 321	255 1140 019	Film 3300pF/50V	CQ92M1H332J
C322	255 1134 025	Film 0.01μF/50V	CQ92M1H103J
C323	255 1135 008	Film 8200pF/50V	CQ92M1H822J
C324	255 1256 000	Film 7500pF/50V	CQ92M1H752J
C512	253 9030 060	Ceramic 0.01μF/25V	CK45=1E103K
C513	253 9030 086	Ceramic 0.022μF/25V	CK45=1E223K
C514	254 4256 949	Electrolytic 100μ/25V	CE04W1E101M
C520	254 4256 949	Electrolytic 100μ/25V	CE04W1E101M
C902, 903	254 4256 088	Electrolytic 1000μ/25V	CE04W1E102M
C908	254 4256 091	Electrolytic 2200μ/25V	CE04W1E222M
C909	254 4250 097	Electrolytic 4700μ/6.3V	CE04W0J472M
C910	254 4235 067	Electrolytic 470μ/10V	CE04W1A471M
C911	253 9031 014	Ceramic 0.068μF/25V	CK45=1E683Z
C913	254 4261 057	Electrolytic 470μ/50V	CE04W1H471M
C914	254 4258 044	Electrolytic 47μ/35V	CE04W1V470M
C915	254 4258 950	Electrolytic 100μ/35V	CE04W1V101M
C917	254 4256 949	Electrolytic 10μ/25V	CE04W1E100M
C922	254 4260 061	Electrolytic 3.3μ/50V	CE04W1H3R3M
C923, 924	254 4256 936	Electrolytic 47μ/25V	CE04W1E470M
C925, 926	254 4256 949	Electrolytic 10μ/25V	CE04W1E100M
C927, 928	254 4256 936	Electrolytic 47μ/25V	CE04W1E470M
C929	254 4258 044	Electrolytic 47μ/35V	CE04W1V470m
OTHER PARTS			
L301	231 0078 005	OSC coil	
SW523	212 1039 000	Push switch	
SW520	212 9572 006	Slide switch	
⚠T901	233 9676 006	Power transformer	Europe, U.K., Australia, Asia & Hongkong models
⚠T901	233 9678 004	Power transformer	U.S.A., Canada & Taiwan models
CB143	205 0981 009	3P connector base	
CB253	205 0981 041	8P connector base	
CB254	205 0981 038	6P connector base	
W191	204 6568 009	15P connector cord	
W255	203 8457 005	5P connector cord	
W254	204 0509 006	6P connector cord	
W005	203 0639 012	1P wire	

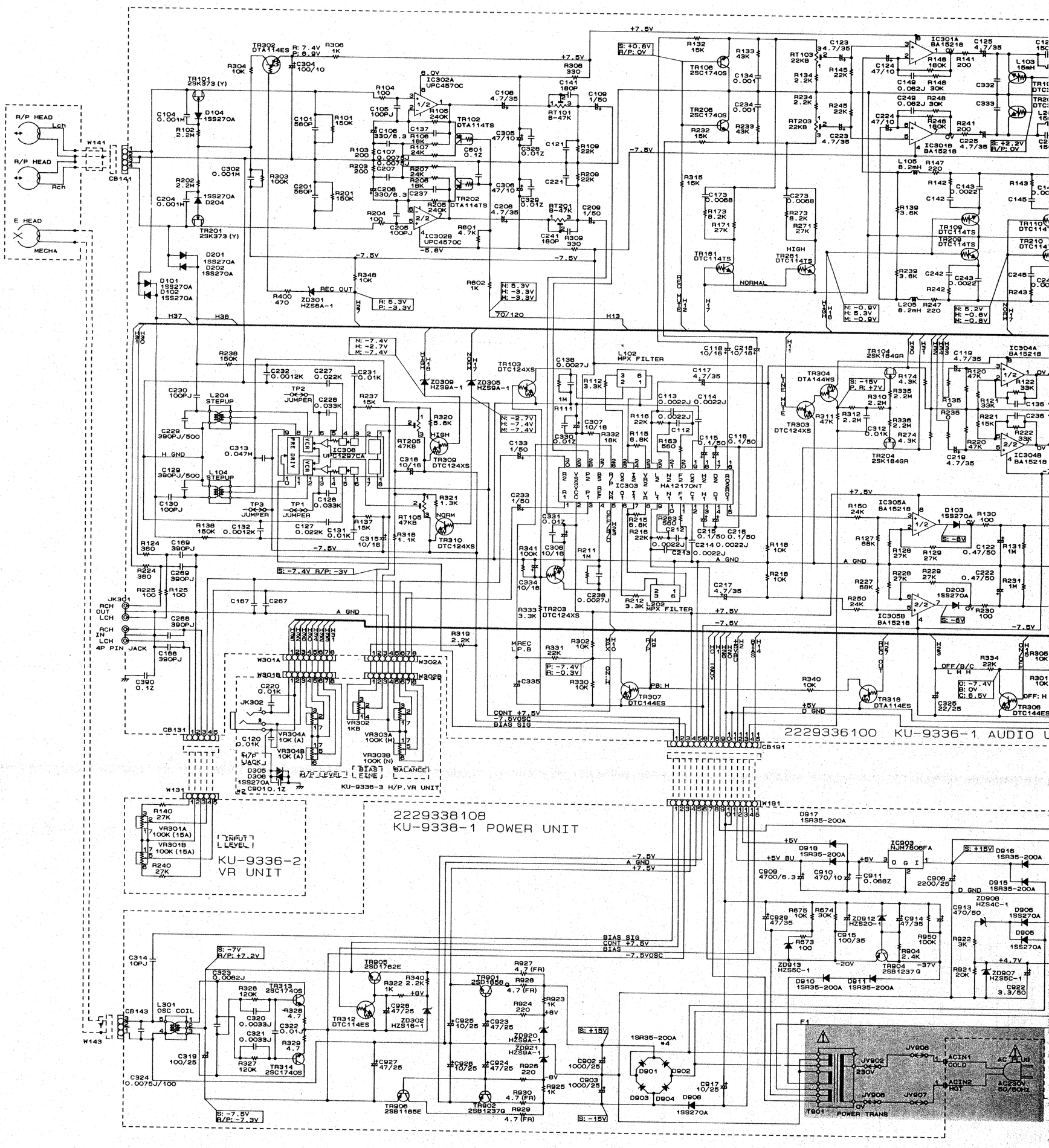
BUNDLE DIAGRAM

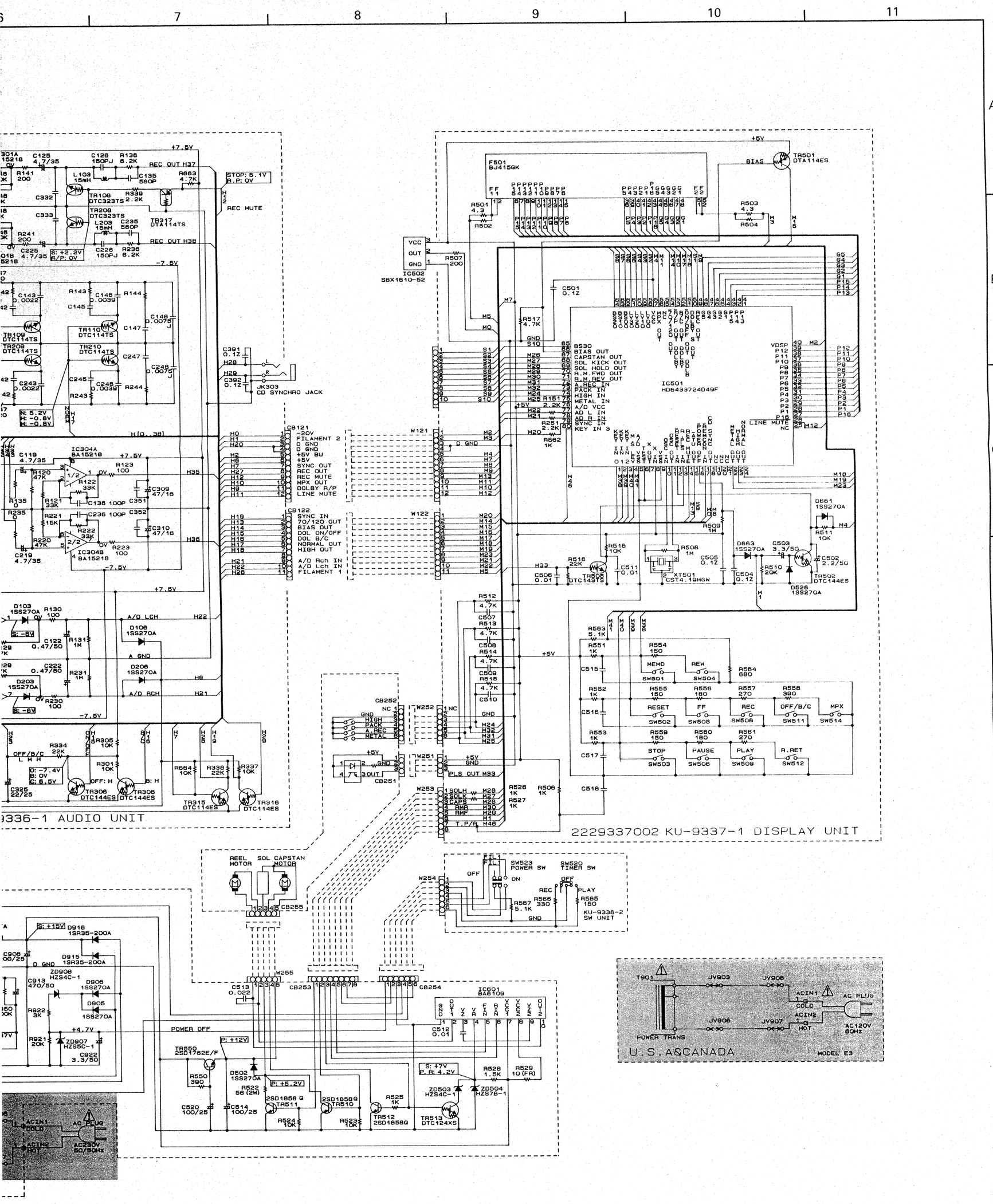


WIRING DIAGRAM



SCHEMATIC DIAGRAM



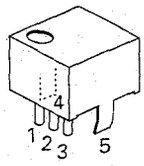


Note:
- Resistance shall be 1/4 W unless otherwise specified and the unit is ohm.
- The unit of capacitor is μF, P is pF unless otherwise specified.
- This circuit diagram shows the basic circuit. It is subject to change for the purpose of improvement.

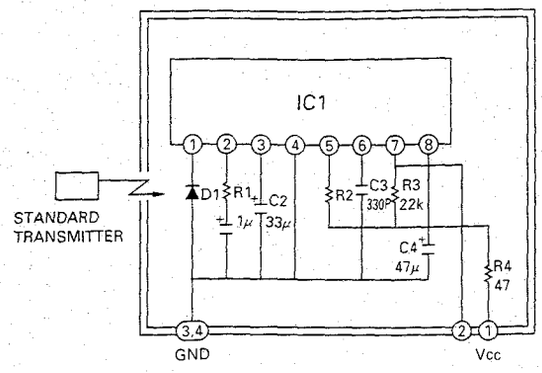
Parts marked with this symbol ⚠ ▭ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

• REMOTE SENSOR

- SBX1610-52(IC502)



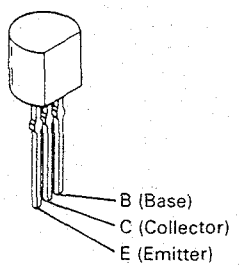
1. Vcc
2. Output
3. GND
4. Case Fin
5. Case Fin



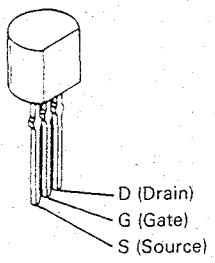
IC1	: CX20106A Chip
D1	: PIN Photo Diode Chip
C1, C2, C4	: Aluminum Electrolytic Capacitor
C3	: SL Characteristic ±5%
R1	: Gain Adjuster
R2	: fo Adjust ±1% USE
R3, R4	: ±5%

• TRANSISTORS

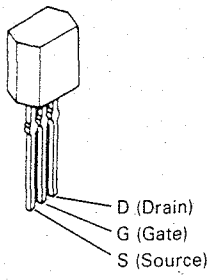
- 2SC1740S



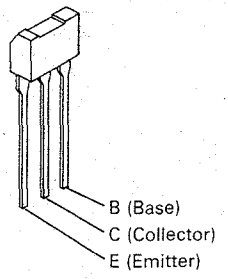
- 2SK373 (Y)



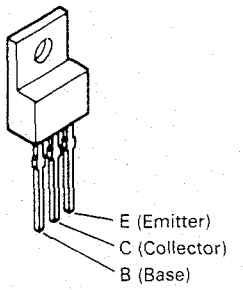
- 2SK184GR



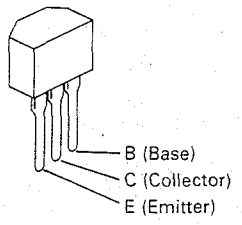
- 2SB1237Q/R
- 2SD1858Q/R

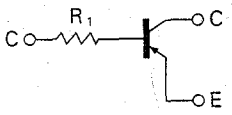


- 2SB1185Q/R
- 2SD1762E/F

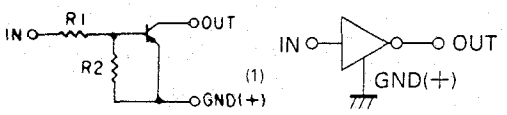


- DTA114ES
- DTA114TS
- DTA144WS
- DTC114ES
- DTC114TS
- DTC124XS
- DTC143TS
- DTC144ES

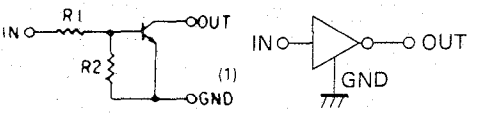




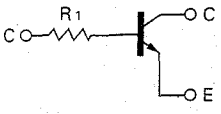
	R1
DTA114TS	10 kohm



	R1	R2
DTA114ES	10 kohm	10 kohm
DTA144WS	47 kohm	22 kohm



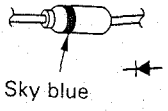
	R1	R2
DTC114ES	10 kohm	10 kohm
DTC124XS	22 kohm	47 kohm
DTC144ES	47 kohm	47 kohm



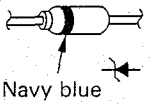
	R1
DTC114TS	10 kohm
DTC143TS	4.7 kohm

• DIODES

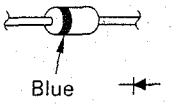
- 1SS270A



- HZS4C-1
- HZS5C-1
- HZS6A-1
- HZS7B-1
- HZS9A-1
- HZS20-1



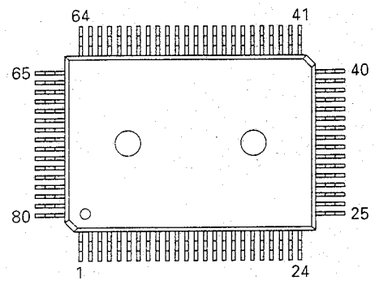
- 1SR35-200A



SEMICONDUCTORS

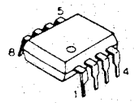
• IC's

HD6433724D49F (IC501) μCOM

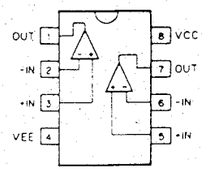


No.	I/O	PORT NAME	FUNCTION
1	I	KET IN 0	ANALOG INPUT CHANNEL
2	I	KET IN 1	ANALOG INPUT CHANNEL
3	I	KET IN 2	ANALOG INPUT CHANNEL
4	I	M.S LEV	ANALOG INPUT CHANNEL (M.S LEVEL)
5	I	A/D Vss	A/D GND
6	I	TEST	GND
7	O	X O	NC
8	I	X I	Vcc
9	I	Vss	GND
10	I	OSC I	SYSTEM CLOCK OSCILLATER: 4.19 MHz
11	O	OSC O	SYSTEM CLOCK OSCILLATER: 4.19 MHz
12	I	RESET	RESET IN: LOW ACTIV
13	I	PLS IN	REEL PULSE IN
14	O	NC	REC MUTE OUT ON=H
15	O	ATU OUT	AUTO TUNING MODE: ON=L (550 unused)
16	I	POWER OFF	POWER OFF IN: LOW ACTIV
17	I	REMCON	REMCON IN : LOW ACTIV
18	O	SYNC OUT	CD SYNCHRO : HI ACTIV
19	I	NC	GND
20	O	NC	NC
21	O	NC	NC
22	O	METAL OUT	METAL (TYPE IV): H
23	O	HIGH OUT	HIGH (TYPE II): H
24	O	NORMAL OUT	NORMAL (TYPE I): H
25	O	NC	NC
26	O	LINE MUTE OUT	LINE MUTE: L
27	O	SEG P16	VFD SEGMENT OUTPUT
28	O	SEG P1	VFD SEGMENT OUTPUT
29	O	SEG P2	VFD SEGMENT OUTPUT
30	O	SEG P3	VFD SEGMENT OUTPUT
31	O	SEG P4	VFD SEGMENT OUTPUT
32	O	SEG P5	VFD SEGMENT OUTPUT
33	O	SEG P6	VFD SEGMENT OUTPUT
34	O	SEG P7	VFD SEGMENT OUTPUT
35	O	SEG P8	VFD SEGMENT OUTPUT
36	O	SEG P9	VFD SEGMENT OUTPUT
37	O	SEG P10	VFD SEGMENT OUTPUT
38	O	SEG P11	VFD SEGMENT OUTPUT
39	O	SEG P12	VFD SEGMENT OUTPUT
40	I	VDSP	VFD POWER SOURCE
41	O	SEG P13	VFD SEGMENT OUTPUT
42	O	SEG P14	VFD SEGMENT OUTPUT
43	O	SEG P15	VFD SEGMENT OUTPUT
44	O	G1	VFD DIGIT-SEGMENT
45	O	G2	VFD DIGIT-SEGMENT
46	O	G3	VFD DIGIT-SEGMENT
47	O	G4	VFD DIGIT-SEGMENT
48	O	G5	VFD DIGIT-SEGMENT
49	O	REC OUT	REC OUT: REC=H
50	O	DOLBY S OUT	DOLBY S OUT (550 unused)
51	O	DOLBY ON/OFF	DOLBY ON/OFF OUT: OFF=H
52	O	DOLBY B/C	DOLBY B/C OUT: B=H
53	O	DOLBY R/P	DOLBY R/P OUT: PB=H
54	O	70/120	70/120 OUT: 70 uS=L
55	O	NC	
56	O	MPX OUT	MPX OUT: ON=H
57	I	Vcc	+5 V
58	O	LV00	AUTO TUNING LEVEL DATA (550 unused)
59	O	LV10	AUTO TUNING LEVEL DATA (550 unused)
60	O	LV20	AUTO TUNING LEVEL DATA (550 unused)
61	O	LV30	AUTO TUNING LEVEL DATA (550 unused)
62	O	BS00	AUTO TUNING BIAS DATA (550 unused)
63	O	BS10	AUTO TUNING BIAS DATA (550 unused)
64	O	BS20	AUTO TUNING BIAS DATA (550 unused)
65	O	BS30	AUTO TUNING BIAS DATA (550 unused)
66	O	BIAS OUT	BIAS OUT H=OSC
67	O	CAPSTAN OUT	CAPSTAN MOTOR OUT
68	O	SOL K OUT	SOLENOID KICK OUT
69	O	SOL H OUT	SOLENOID HOLD OUT
70	O	RM.F OUT	REEL MOTOR FORWARD OUT
71	O	RM.R OUT	REEL MOTOR REVERSE OUT
72	I	A. REC IN	A. REC IN: LOW ACTIV
73	I	PACK IN	PACK (CASSETTE) IN: LOW ACTIV
74	I	HIGH IN	HIGH (TYPE II) IN: HI ACTIV
75	I	METAL IN	METAL (TYPE IV) IN: HI ACTIV
76	I	AV cc	ANALOG POWER SOURCE
77	I	AD L IN	LVEL METER Lch IN
78	I	AD R IN	LVEL METER Rch IN
79	I	SYNC IN	CD SYNCHRO IN: LOW ACTIV
80	I	KEY IN 3	ANALOG INPUT CHANNEL

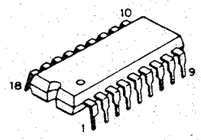
• BA15218 (IC 301, 304, 305)
• μPC4570C (IC302)



• BA15218
• μPC4570C



• μPC1297CA (IC308)



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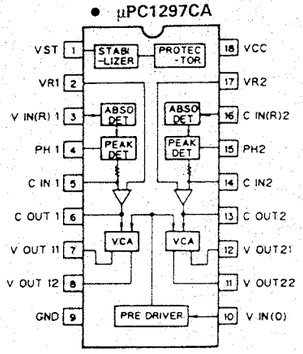
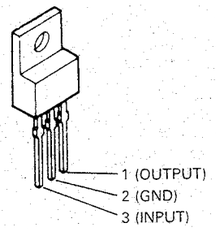
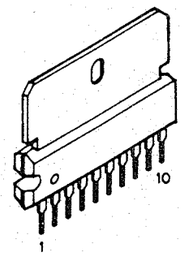
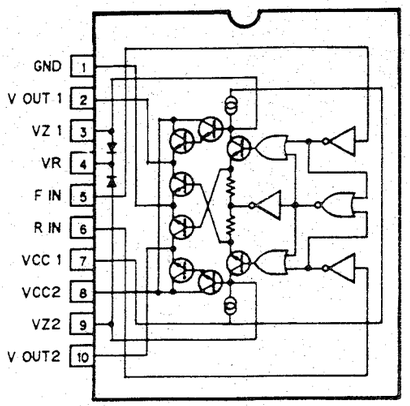


• MC7806FA (IC903)



• BA61091 (IC601)





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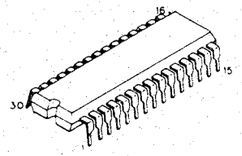

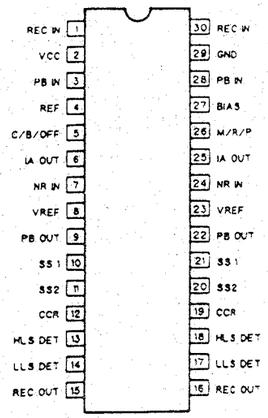

• REI
• SI